

Chapter 3 – Management Alternatives

3.1 Introduction

This chapter describes several approaches that could be taken to manage the resources and visitor uses on public lands in the Lacks Creek area. The National Environmental Policy Act (NEPA) requires federal agencies to consider a reasonable range of alternative approaches when proposing and analyzing federal actions, including plans. In the case of Lacks Creek, two “action” alternatives and a “no action” alternative have been analyzed. The focus or theme of each of these alternatives is described in more detail below. Each action alternative must meet the purpose and need for the plan (see Chapter 1) and address issues identified by the public during scoping. Of these two alternatives, the BLM has identified the “proposed action”, as the alternative that the agency feels would best meet the management needs of Lacks Creek. Each alternative is designed so that it could serve as a stand-alone plan. The no-action alternative is required by NEPA and provides a benchmark description of current management to allow comparison of the “action” alternatives. For the purposes of this plan, the No Action Alternative would constitute continued implementation of the Arcata RMP and associated custodial management of the area.

Each alternative addresses the management of all resources and resource uses within the management area including biological resources (vegetation, wildlife and fisheries), fire and fuels management, water resources, cultural resources, scenic and visual resources, recreation use, road and trail management, and Areas of Critical Environmental Concern (ACECs).

The alternatives include objectives and associated actions for management of each resource or use. The objectives describe outcomes or “desired future conditions” for different components of the resource or resource use. Some objectives are common to alternatives while others will vary by alternative. Achievement of certain objectives such as the creation of late successional habitat in previously harvested stands will be realized well beyond the life of this plan. In these cases, the plan intent is to describe actions that would be taken over the life of the implementation horizon (approx. 10-20 years), to move towards achievement of the longer-term objectives.

In summary, the alternatives represent a reasonable range of approaches to managing land and uses consistent with law, regulation, and policy. They also provide a framework to evaluate the potential impacts to the management area that could occur as a result of implementing various management scenarios.

A final plan and Decision Record will be developed based on public input on this preliminary plan and EA. This final document will guide future management of Lacks Creek. The BLM has the discretion to select an alternative in its entirety or to combine elements of the various alternatives presented in this preliminary plan/EA to develop the plan. The reader may also select and/or combine elements of the various alternatives when providing comments on the plan.

3.2 Alternative Approaches

Each alternative provides a different approach to managing Lacks Creek area resources as described below:

Alternative 1 (Proposed Action) -The proposed action represents the BLM's effort to develop an optimum course of action for area restoration and management that addresses the direction in the Arcata RMP and the issues identified by the public and other agencies during scoping. This alternative focuses on active protection, monitoring and restoration of resources within the watershed while providing for a variety of compatible public uses. Restoration efforts would be focused on previously harvested forests, oak woodlands/prairies, and watersheds/water quality – Watershed restoration would benefit Lacks Creek and the downstream resources of Redwood National and State Parks.

Alternative 2 - This alternative still contains a focus of restoration, but includes a more accelerated approach to implementing projects over a larger part of the landscape. As with the other alternatives, the rate of implementation would be dependent on available funding. This alternative also provides for a broader array and higher levels of public use and access while still retaining the overall restoration/protection focus. For example, prairie restoration would be more aggressive under this alternative, with the removal of some larger trees that have encroached since the 1950s. Also, a larger number of recreation trails would be constructed.

Alternative 3 (No action) - Under this alternative management will continue following the guidelines identified in the 1995 Arcata Planning Area Proposed Resource Management Plan Amendment and Environmental Assessment (RMP). This alternative represents a more limited approach to resource restoration, and also provides for more limited public access improvements. For example, no interventions taken to restore prairies from forest encroachment, and only a few previously harvested stands would be treated to accelerate restoration of late successional characteristics.

3.3 Use of Adaptive Management Process

Secretary of Interior Order Number 3270 calls for the BLM and other agencies in the department to incorporate Adaptive Management (AM) principles into management plans and programs where appropriate. The Secretarial Order also directs that “*Adaptive Management: The U. S. Department of the Interior Technical Guide*” (Williams, 2007) be used as the technical basis for implementing AM programs.

Adaptive Management recognizes that ecosystems are very complex and understanding of their processes & responses to management actions is limited. Thus, the greatest hurdle to overcome in implementing effective restoration and other management actions is uncertainty regarding their effectiveness. Adaptive management acknowledges that there is incomplete data when dealing with natural resources, and that through continued research and monitoring of management practices, new information will be collected. This new information is evaluated, and a determination is made whether to adjust the strategy accordingly to improve success in meeting plan objectives.

As the Technical Guide points out, AM is only warranted when:

1) there is a need to take action in the face of uncertainty; 2) there is an opportunity to apply learning; 3) the objectives of management are clear; 4) the value of reducing uncertainty is high; 5) uncertainty can be expressed in a set of competing testable models, and 6) a monitoring program design can be put in place with a reasonable expectation of reducing uncertainty.

The Lacks Creek Management Area meets several of the above parameters. The area is a complex ecosystem with natural conditions that have been altered by past land uses. Considerable research and monitoring has already been implemented in determining successful restoration techniques in the region, and some restoration techniques have been well tested. However, there are still opportunities to learn how to improve/optimize various management treatments for such values as restoring endangered species habitat, and previously harvested forests. This plan contains clear objectives for management outcomes or “desired future conditions” of the various resources in the management area. The plan also lists a suite of actions and projects that will be taken in an effort to restore and manage ecosystems to meet the plan objectives. The predicted outcomes of implementing plan actions, and the uncertainty/assumptions associated with their implementation are discussed in the impact analysis chapter. Formal predictive models, monitoring programs, and associated management adjustments have not been directly built into the plan. However, monitoring is an important component of plan implementation and will be used to gauge the effectiveness of actions at achieving objectives. This will serve as a feedback loop so that managers can learn how effective actions are at achieving plan objectives, and learn/adjust if required. If the adjustments are outside the scope of this plan analysis, they would be completed with additional NEPA documentation.

In summary, although this plan is structured to only meet appropriate aspects of the formal DOI Adaptive Management Framework, the BLM would apply certain AM principles in implementing the plan. Note that AM does not give managers an open book to implement any action deemed necessary to meet plan objectives. For example, if a proposed approach is outside of the scope of impact analysis of this plan, additional environmental documentation, including a possible plan amendment, would be required.

3.4 Organization and Readers Guide to Alternatives

3.4.1 Chapter Organization

The following resources and resource uses are described under each alternative:

Cultural Resources Management (3.5.1)

Fisheries, Riparian and Water Quality Management (3.5.2)

Wildlife Management (3.5.3)

Vegetation Management (including Forest Management) (3.5.4)

Recreation and Transportation Management (3.5.5)

Visual Resources Management (3.5.6)

Fire and Fuels Management (3.5.7)

The following land use allocations identified for management under the Arcata Resource Management Plan are not discussed as stand-alone topics under the alternatives -- Wild and Scenic River (WSR) Interim Management, Park Protection Zone (PPZ) management, and ACEC Management. Meeting the goals of each of these protective land use allocations involves the management of a number of resources/resource uses discussed under other sections of the plan alternatives. For example, all three allocations call for protection and restoration of old-growth forests/habitat and water quality/fisheries values. Objectives and management actions for these resources are discussed in their respective sections. A primary purpose and need for this plan is to protect the values identified under these allocations/designations. Therefore, a summary of how each alternative serves to protect values related to the PPZ, WSR and ACEC is contained in the environmental effects chapter (Chapter 4).

3.4.2 Actions and other Guidance Common to all Alternatives

Standard Operating Procedures: The Standard operating procedures identified in Appendix A for Fisheries, Riparian and Water Quality (A-1), Wildlife Management (A-2), Forest Management (A-3), Recreation And Transportation Management (A-4), and Fire Management (A-5) would be implemented as standard management practices under all alternatives.

Planning direction incorporated by Reference: Section 1.5 of this plan identifies specific policies and plans that the proposed action and alternatives must conform with – These include the Standards and Guidelines of the Northwest Forest Plan (1994) which serve as standard operating procedures for the management area.

3.5 Alternative 1 (Proposed Action)

3.5.1 Cultural Resources Management

Objectives: Conduct in-depth research on all aspects of past human use of the environment in this area. Compile a comprehensive record of all prehistoric and historic cultural resources known to exist within the Lacks Creek Management Area. Protect and interpret at-risk and/or particularly interesting cultural resources for the enhancement of visitor experiences.

Management Actions:

- Create a cultural context document for the Lacks Creek watershed that will synthesize, within a regional context, all available information on the prehistoric and historic uses of the landscape.
- Record/re-record cultural properties within the Lacks Creek Management Area
- Develop a cultural resources management plan that will both protect and interpret significant historic properties.
- Coordinate with other programs to avoid negative impacts to cultural resources and allow for public appreciation of those resources.
- Create and deploy informative interpretive materials for the benefit of the visiting public, in the forms of signs, brochures, and web-based presentations.

3.5.2 Fisheries, Riparian and Water Quality Management

Objectives: The objectives for managing Lacks Creek include protection and restoration of watershed processes and habitat for native fish, fauna and riparian-dependent species. Habitat conditions which would meet these goals are: 1) Summer water temperatures not regularly exceeding 68°F or at a Mean Weekly Average Temperature (MWAT) of 64°F or lower; 2) Riparian canopy cover over much of the stream to provide shade adequate for maintaining water temperatures low enough to support anadromous salmonids; 3) The composition of the riparian forests to include a significant component of larger conifer trees which provide not only shade but also provide areas of decreased water velocity, streamside stability during high streamflow events and function as future sources of large woody debris; 4) Approximately 50 percent of the habitat are pools at least one meter deep with abundant cover within fish-bearing portions of the stream; 5) Bank erosion limited to the outside bends of channel meanders with other occasional small-scale bank failures and 6) Abundant, high-quality, stable spawning habitat for anadromous salmonids located at the tail of pools and in flatwater reaches.

Management Actions:

- Implement erosion control efforts (decommissioning and upgrading road segments) within a 15-year time period. Work would be conducted during dry conditions (usually June through October).
- Decrease the levels of future erosion by treating sediment sources therefore eliminating much of the road-related erosion (see Appendix A-1, Standard Operating Procedures for Fisheries, Riparian and Water Quality)
- Roads needed for administrative use would be upgraded so that the risk of future erosion and future maintenance requirements are minimized. Roads identified with no future use requirements would be decommissioned eliminating the potential for any significant erosion.
- Upgrade the following roads proposed for access to perform vegetation treatments and trail maintenance activities: FL 1000, PP1000, LC 1000, LC 1100, LC2000, BS1500, RP 1000 (portion uphill from the prairie), FP 1000, BO1600, PR 1100, and PR 1000 (see Map 3-2). The total length of roads identified for upgrading is 13.5 miles. Upgrades include actions such as replacing culverts which have potential for causing significant future erosion, improving road drainage to minimize water concentration, shaping and sloping roads to minimize future erosion potential, and adding surface materials as needed to prevent rutting and water concentration.
- Priority roads identified for decommissioning include RP1000, RP 1250, FL 1000, FL1025, FL1035, FL1030, PP 1000, PP 1110, PP 1105, RP 1000, RP1200, PP1110 FP 1000, FP1005, FP1015, BO1600, BO1610, BO 1665, and BO 1315. The total length of roads identified for decommissioning is 24.1 miles. Road decommissioning includes complete removal of culverts and/or “Humboldt crossings” at points where a road crosses a stream (stream crossings), removal of fill material from stream crossings and swales, de-compaction (also called “ripping”) of road surfaces, and pulling fill material from the outside edge of the road to outslope the former road bed. In addition, excavated woody material, brush, and other mulch materials would be placed on newly exposed bare soil surfaces to prevent surface erosion. If necessary, additional mulch materials such as weed-free straw may be used. A portion of the decommissioned roads would be converted to trails (see Recreation section).

- All other road segments not identified in this plan for upgrading or decommissioning and which pose a substantial risk of future erosion may also be upgraded or decommissioned. If potential impacts from this additional decommissioning are determined to be beyond the scope of the impact analysis for this plan, additional NEPA documentation and ESA Consultation would be completed at the appropriate level (see Maps 3-1 and 3-2).
- Road decommissioning and upgrading would be accomplished through use of heavy equipment such as excavators, bulldozers, and dump trucks. To the extent feasible, fill material would be stored adjacent to, or near treated areas. When such storage is not feasible, fill material would be transported to stable locations off-site and shaped such that the possibility of future erosion would be minimal.
- Continue working cooperatively with landowners in the Redwood Creek basin to prioritize treatment of erosion sources throughout the basin via the Redwood Creek Watershed Group
- In cooperation with Redwood National and State Parks and CDF&G, monitor habitat conditions to measure summer water temperatures, and conduct stream surveys which include measurements of pool depth, riparian forest composition, bank erosion, and availability of spawning gravels

3.5.3 Wildlife Management

Objective: Protect existing late successional habitat which provides habitat for northern spotted owls, marbled murrelets, and Pacific fishers. Increase the availability of suitable nesting, roosting, and foraging habitat for northern spotted owls, nesting habitat for marbled murrelets, and denning, resting and foraging habitat for Pacific fishers. Accelerate the development of old-growth forests of sufficient size to support four breeding pairs of Northern Spotted Owls (over the long-term). Reclaim and maintain foraging habitat for elk and deer. Enhance and maintain suitable habitats for other wildlife species including; BLM sensitive species, migratory birds, raptors, bats, reptiles, amphibians and small mammals. Monitoring, surveys, and assessments are also incorporated.

Management Actions:

Northern Spotted Owl

- Conduct protocol surveys for spotted owls within suitable habitat on a project specific basis and periodic surveys throughout the management area to determine trends in owl activity center numbers, locations, and productivity.
- Monitor for barred owls.
- Expand and improve nesting, roosting, and foraging habitat by promoting late successional forest habitats sufficient to sustain four breeding pairs (see Forest Management Proposed Action - mechanical thinning).
- Conduct project level assessments, surveys, and Section 7 Consultation with US Fish and Wildlife Service as required.

Marbled Murrelet

- Conduct protocol surveys for marbled murrelets within suitable habitat on a project specific basis.

- Accelerate the development of late successional forest habitats on approximately 780 acres of previously harvested conifer forest habitat (see Forest Management Proposed Action - mechanical thinning).
- Conduct project level assessments, surveys, and Section 7 Consultation with US Fish and Wildlife Service as required.

Pacific Fisher

- Conduct inventories for populations and delineate suitable habitat throughout the management area.
- Expand and improve fisher denning and resting habitat by promoting late successional forest habitats (see Forest Management Proposed Action – mechanical thinning).
- Increase denning and resting sites by leaving snags and down trees (see Forest Management Proposed Action).
- Enhance and maintain existing fisher habitat by implementing forest practices gradually, over the course of three to six years.
- Implement conservation objectives and recommended approaches from the West Coast Fisher Population Conservation Assessment and Strategy Plan once finalized.
- Conduct fisher research cooperatively with Tribal, State, and University partners.

Elk

- Monitor elk use within prairie and oak woodland habitats.
- Work cooperatively with Rocky Mountain Elk Foundation, CA Department of Fish and Game, and other partners to enhance elk habitat .
- Increase elk foraging habitat through;
 - Prairie restoration (see Vegetation & Fire Proposed Action).
 - Oak woodland restoration (see Forest Management Proposed Action).

Other Wildlife Species or Special Habitat Features.

- Conduct habitat assessments and surveys on a project specific basis to determine use by BLM sensitive or other native species or important habitat features (such as raptor nesting cliffs etc.) and determine protective measures necessary.
- Support efforts to reintroduce native species such as California Condor (*Gymnogyps californianus*) to the area, as long as such introductions are compatible with other management objectives in the plan.

3.5.4 Vegetation Management (including Forest Management)

3.5.4.1 Prairies

Objective: Actively maintain prairies at 2005 distribution levels, and at a Fire Regime Condition Class 1 (see Appendix B-2). Prevent additional loss of prairie cover type to conifer encroachment in order to maintain a mosaic of habitat types for plants and wildlife. Restore prairies to levels beyond 2005 inventoried distribution levels where evidence of recent encroachment of conifers (dbh =12 inches) and presence of residual prairie species provide clear indicators of historic contiguous prairie. Maintain prairie type which represents a dominance of native perennial bunchgrasses and interstitial native herbs, with pockets of scattered and isolated

white and black oaks within the prairie and along the periphery. The desired condition is that Douglas-fir/mixed-hardwood forest vegetation is absent to scarce within prairies.

Management Actions:

- Remove conifer, tanoak and/or other forest vegetation encroachment within existing prairies (approximately 102 acres) through mechanical methods and prescribed fire. Conduct immediate mechanical removal of conifers that are shading white or black oaks at the boundaries of prairies.
- Burn the prairies with vehicular access to them in the late fall to early spring on a rotation of 5-10 years to maintain openness and species diversity.
- Monitor and maintain scattered and isolated white and black oak pockets within the prairie community and along the periphery.
- Inventory young oaks and consider temporary protective barriers until trees attain a height resistant to wildlife or livestock grazing impacts if it is determined that there is a lack of oak recruitment.
- Grazing management on a project basis may be utilized as a tool to help maintain Faulkner, Sidehill, Pine Ridge, and Kit prairies. Livestock grazing on all other prairies would not be authorized due to deed restrictions. Project level grazing does not denote establishment of a BLM grazing allotment to allow for forage use, but rather reflects an approach to livestock use as a tool to achieve a specific ecological objective/vegetation treatment; such as turning out livestock during a narrow season of use to maximize beneficial effects to native perennial bunchgrasses and interstitial native herbs.
- Grazing management projects would be carefully controlled to prohibit livestock use/trespass into deed restricted areas (maintain gate closure on road access to Preston prairie) as well as to the Lacks Creek Management Area as a whole with the exception of desired project level grazing in the specific prairies identified.
- Temporary range improvements may be utilized to control livestock distribution and desired intensity of use.
- Invasive weeds that may appear within prairies, such as Scotch broom, French broom (*Genista monspessulana*), or Harding grass (*Phalaris aquatica*) would be eradicated using an integrated management approach.
- Roads traversing prairies would be disked/ripped and reshaped to facilitate natural reseeding and reclamation, or may be converted to trail routes (within Flyette, Preston, and/or Faulkner prairies).

3.5.4.2 Weeds

Objective: Pursuant to Executive Order 13112, preventative action would be taken to limit the opportunities for the introduction or establishment of invasive, non-native plant species within the management area.

Management Actions: The following prevention measures would be incorporated in all contracts and activities.

- Road side trees shall be maintained to the extent feasible so as to provide sufficient shade to prevent establishment of sun-loving invasive weeds.

- All heavy equipment and vehicles contracted to conduct project activities shall be inspected and cleaned of any reproductive plant parts prior to entry onto BLM public lands.
- Any fill material obtained to be imported into any project site will be inspected and determined to be invasive, non-native weed free.
- Should any invasive, non-native weeds become established on any project site(s) following soil disturbing activities, the BLM project inspector shall notify the field office invasive weed program coordinator so that immediate eradication actions can be coordinated.

3.5.4.3 Forest Management

Objectives: Use various silvicultural treatments to accelerate the development of late successional forest characteristics. The public lands within the Lacks Creek watershed are designated as a Late Successional Reserve (LSR) (USDI/USDA 1994, Northwest Forest Plan) and one of the main objectives of the Reserve is to protect and enhance late successional forest stand characteristics. Forest treatments projects using silvicultural practices, and conducted using the standards and guidelines in Northwest Forest Plan (USDI/USDA 1994), would be used to accelerate the development of late seral forest stand conditions. Silvicultural treatments are an effective means of reducing the fuel loading within a forest stand and reducing the risk of a stand replacement fire. Other objectives include maintaining the oak woodlands, grasslands and restoring the Douglas-fir vegetation component within dense hardwood (tanoak) stands. Silviculture treatments within riparian reserves will be designed in a manner, and will only be implemented, to help attain the Aquatic Conservation Strategy objectives within the Northwest Forest Plan (USDI/USDA 1994).

Management Actions:

- Silvicultural treatments that are planned include the pre-commercial and commercial thinning of previously harvested stands, hardwood stand conversion, partial removal of the conifer component within the oak woodland and meadow/grassland restoration.
- Silvicultural and restoration treatments would be implemented primarily through agreements, stewardship contracts and/or service contracts.

Pre-commercial thinning – 445 acres

- Conduct pre-commercial thinning in young conifer plantations where trees of no commercial value would be removed. These stands are presently overstocked with evenly spaced conifers and abundant tanoak and madrone regrowth. The diameter and height growth of the conifers are far below the growth potential of the site.
- Most stands are stocked with 300 to 500+ Douglas-fir seedlings or saplings per acre and would be reduced to 200 to 250 trees per acre.
- Thinning would be accomplished by hand crews using chainsaws.
- Conifers would be thinned to an approximate spacing of 15' X 15'.
- No trees, both conifers and hardwoods, greater than 8" would be cut.
- The largest and healthiest conifers would be selected for leave trees, as they are most able to take advantage of the additional growing space.

- Hardwoods smaller than 8” would be retained for structural diversity if insufficient hardwoods greater than 8” are present to assure species and structural diversity.
- All native brush species and snags would be left standing.
- The resulting slash would either be lopped and scattered or piled and burned to reduce the fuel loading .
- Hardwoods would not be removed in areas not stocked with conifers. This assures random spacing and assists in the development of structural diversity

Commercial thinning – 331 acres

- Conduct commercial thinning in pole size stands that are larger than 10”. These stands are usually older than 40 years and were established in the 1950’s and 60’s. In the more vigorous stands, some trees up to a diameter of 20” would be removed.
- Merchantable material would be removed by mechanical equipment and hauled offsite.
- Thinning would involve the removal of suppressed conifers, also called “thinning from below” where only the smaller suppressed trees are removed.
- No hardwoods would be removed to aid in the development of structural diversity and maintain the hardwood component in the stand.
- All native brush and snags would be left standing.
- The resulting slash would be either lopped and scattered or piled and burned to reduce the fuel loading.

Hardwood conversion – 340 acres

- Conduct hardwood conversion treatments involving the conversion of nearly pure hardwood stands back to the more natural forest composition of a dominant conifer stand with a hardwood component. These hardwood stands, mostly tanoak and madrone, developed following the logging practices of the 1950’s and 60’s. The stands were either clear cut or “high graded” with no follow-up silvicultural treatments. As a result the stands have developed into almost pure dense hardwood stands with a very small conifer component.
- Create numerous large openings with the removal of the dense tanoak component Douglas-fir seedlings would be planted in openings to develop a more naturally diverse forest stand.
- No mature hardwoods or any conifers would be removed with this treatment. Only young hardwoods that became established after logging would be removed.
- The cut hardwoods would be sold to the general public or sold to a contractor. Selling the hardwoods would help in recovering some of the cost of the treatment, reduce the fuel loading and provide a useful product to the local community.
- The resulting slash would be piled and burned or lopped and scattered.
- Douglas-fir seedlings would be planted after the hardwoods have been removed and the slash piles have been burned.

Oak woodland restoration – 253 acres

- Implement oak woodland restoration treatments involving the removal of young Douglas-fir trees that have encroached into the white and black oak vegetation series. These oak habitats were historically maintained by a fire regime (Regime Class 1 as described in Appendix B-2) and are now being encroached upon by Douglas-fir. Without the mechanical removal of the conifers or the re-introduction of fire this vegetation series would decrease in area, and in time, may be lost.

3.5.4.4 Special Forest Products

Objectives: Provide special forest products to the public for both personal and commercial usage. Special forest products include fuel wood, mushrooms, and other vegetative products (beargrass, huckleberry, salal, etc.). The BLM would provide these forest products at levels that do not compromise their sustainability or associated ecosystem processes.

Management Actions:

- Issue commercial or personal use permits.
- When necessary, additional (beyond standard) stipulations would be identified on special forest product permits for resource protection.
- Fuel wood permits would be issued on a case-by-case basis following winter storms to assist in clearing roads and related to forest restoration or fuel reduction projects.
- A seasonal restriction for commercial mushroom collection would be established.
- No seasonal restrictions would be placed on personal mushroom permits, although these permits may be restricted as to the amount, location and length of collection.
- All mushroom collection permits would be monitored to document resource damage.

3.5.5 Recreation and Transportation Management

Objectives: Provide appropriate recreation opportunities, experiences, and benefits for visitors. Anticipated activities include vehicle touring, hiking, mountain biking, horseback riding, hunting, sightseeing, bird watching, and overnight camping. Some opportunities to be provided for user groups include:

- *Mountain bikers:* Offer safe, challenging trail riding conditions that allow visitors to develop skills and abilities, and pursue family and group riding opportunities
- *Equestrians:* Provide new areas to explore, offer easy to moderately difficult riding opportunities in a natural setting, offer improved access to remote areas, promote opportunities to visit areas with groups or family
- *Motorized Vehicle Users:* Offer access to scenic remote areas along unpaved routes. Provide new areas to explore with friends and family.
- *Hunters:* Provide new areas to scout and hunt, to develop skills and abilities in a setting that requires self-reliance and competence.

The public lands in the Lacks Creek Management Area offer a variety of environmental settings where many of these “quality of life” benefits can be obtained. More specific management-oriented objectives are:

- Maintain and improve appropriate road and trail access.

- Ensure a quality visitor experience and enjoyment of natural and cultural resources through enhanced signing, interpretation, education, and information.
- Ensure the public health, safety, protection, and security of visitors by providing well maintained and accessible facilities and an enforcement presence. Facility developments would be rustic in appearance, blending in with the natural environment to the maximum extent practicable. Facilities located on the west side of Lacks Creek are intended to provide visitors with a semi-primitive or primitive recreation experience. Facilities on the east side of Lacks Creek are intended to provide visitors with slightly more developed or “roaded natural” recreation experience. Proposed facility developments would be phased in over time, based on visitor need and demand, and increased rate of recreation use.
- Minimize user conflicts through facility design and spatial separation of user types.
- Ensure that natural and cultural resource values are protected from visitor impacts by establishing use regulations, educating visitors regarding resource values and proper use, and monitoring.

Management Actions:

Road and Trail Access

1) Road Improvements

- Maintain and/or improve approximately 13 miles of existing roads on the west side of Lacks Creek for administrative uses and as trails. Roads would be open for mountain biking, hiking, and horseback riding.
- Maintain Pine Ridge Road and spurs as needed to provide access by 2WD vehicles. Install new waterbars, culverts, and ditches where needed.
- Improve Lacks Creek Road to provide access by 2WD vehicles. Widen the road width to allow access for small horse trailers, construct turnouts, gravel where necessary, and install vehicle barriers where the road intersects with abandoned access routes. A short section of new road construction may be needed near the hiker/biker trailhead to avoid disturbing a small drainage.
- Maintain Midslope Road for 4WD vehicle use to the first large washout approximately three miles from its intersection with Pine Ridge Road. Brushing, ditching, waterbarring, and culvert cleaning would occur as needed to maintain safe travel conditions. Replace culverts as necessary to provide proper drainage and reduce the potential for soil erosion and sediment transport into streams.
- Monitor the condition of and the amount of vehicle traffic on Bair Road (county road).
- Coordinate with Humboldt County Public Works Department on repair and maintenance requirements and development a Cooperative Maintenance Agreement for Bair Road, if necessary.
- Develop a borrow pit in a location that would not impact watershed values to obtain up to 15,000 cubic yards of rock (over the life of the plan) for use as road and trail base within the management area (see Map 3-2 for location). Additional small borrow locations (up to 10 cubic yards per incident) may be established at other ridgetop sites (away from water courses) for emergency road repairs.

2. Trail Improvements on west side of Lacks Creek

- Use heavy mechanical equipment, decommission approximately 7.5 miles of unneeded roads and convert them to multi-purpose trails, accommodating hikers, bikers, and equestrians
- Use hand labor to convert approximately 6.0 miles of unneeded roads and convert them to multi-purpose trails, accommodating hikers, bikers, and equestrians
- Construct approximately 1.5 miles of new multi-purpose trail on unroaded ground that would either connect converted logging roads or lead to prominent visual attractions such as waterfalls.
- Construct up to 10.0 miles of mountain biking trail separate from other use trails to provide a high quality riding experience and to avoid user conflicts (specific locations for these trails have not been determined, therefore, a separate environmental analyses would need to be completed prior to construction).
- Proposed and future trails would be located so that they avoid private land trespass (i. e. lead people to private land boundaries etc.).
- Trails would be located and designed to minimize watershed impacts as described in Appendix A-4.

3. Trail improvements on east side of Lacks Creek

- Construct approximately 2.0 miles of new hiking trail through Sidehill Prairie that would connect Pine Ridge to the trail network west of Lacks Creek.
- Construct approximately 0.25 miles of new hiking trail and convert nearly 23.0 miles of unmaintained logging road from the end of Midslope Road (washout site four miles from beginning of road) that would connect to the new trail on Sidehill Prairie.
- Construct approximately 1.0 miles of new hiking/equestrian trail from Pine Ridge Prairie to Midslope Road.
- Construct approximately 0.25 miles of new multi-purpose trail from the proposed trailhead at the end of Lacks Creek Road to the proposed trail network on the west side of Lacks Creek.

Information/Interpretation/Education

- Develop an overall visitor orientation brochure for the area, as well as recreation-activity specific brochures.
- Provide web-based information materials including updates on trail conditions, fire restrictions, etc.
- Incorporate use ethics messages into all visitor information and interpretive materials including -- inform all visitors about the remote nature of the area, the presence of adjoining private lands, and the extreme summer fire danger.
- Clearly sign public land boundaries.
- Incorporate information on the significant natural and cultural resource values of the area into interpretive materials.

Facility Development

- Develop a trailhead parking/camping area that would hold up to five passenger vehicles and five horse trailers near to or at the end of the Lacks Creek Road. Facilities would be

designed and located to provide maximum separation of horses from both hikers and bikers. A restroom, vehicle barriers, corrals, signs, picnic tables, fire rings, and a kiosk would be installed. Approximately ¼ mile above this facility, develop a day use parking area to hold up to five passenger vehicles (trailer parking would not be accommodated at this location).

- Develop a trailhead parking area that could hold up to five vehicles at the 3.0 mile mark of the Midslope Road where vehicle barriers, fire rings, and a kiosk would be installed
- Develop an equestrian staging and camping area on Pine Ridge Road. This site would be widened and leveled to accommodate five horse trailers at any one time. A kiosk, fire ring, group picnic table, water tank for horse use only, and corrals would be installed.
- Develop two small trailhead parking areas along Pine Ridge Road: one adjacent to Pine Ridge Prairie and the other adjacent to Sidehill Prairie. Each site would hold up to three vehicles. Ground leveling, road turnout construction, vehicle barriers, fire rings, and a kiosk would be installed at each site.
- Develop five small vehicle pull-in campsites along Pine Ridge Road and Spurs, and one vehicle pull-in campsite on Midslope Road. Each site would hold up to three vehicles. Vegetation would be cleared, and vehicle barriers and fire rings would be installed at each site.
- Designate up to 15 primitive, backcountry campsites for use on a first come, first serve basis. Most of these sites are located on old landings that are sparsely vegetated. Each site would be maintained free of vegetation with a diameter of approximately 50 to 100 feet, and include fire rings and appropriate signing. Water sources nearby some of these sites may be improved slightly by building small rock impoundments so equestrians can carry water in buckets from the streams to the campsite, or by installing short lengths of water line with a spigot at the end. Backcountry campsites, including those determined by a preliminary survey to be suitable for equestrian use, are identified on Map 3-2. Additional backcountry sites may be made available for equestrian use if space criteria and management objectives are met and water is available nearby.
- In general, visitors will be educated about the importance of packing out trash to prevent corvid and other predator populations from increasing. If trash collection is provided, bear and other predator-proof cans would be used.

Regulations and Monitoring

The following rules and regulations would be published in the Federal Register as “Supplementary Rules” pursuant Section 8365.1-6.

- Overnight camping would be allowed at designated sites only.
- Mountain bike and equestrian use would be allowed on designated roads and trails only.
- Campfires are allowed in BLM-provided fire-rings in designated sites only. During wildfire season, campfires would be subject to seasonal restrictions through the process outlined in the Arcata Field Office Fire Restriction and Emergency Closure Plan.
- Use of power equipment such as generators and chainsaws would be restricted to Vehicle Campsites and Trailheads only, and subject to seasonal wildlife closures (February 1-July 31). Chainsaws could be used outside of these locations for firewood cutting with a valid BLM permit.
- Firearms and archery use would be allowed throughout the area.

- Public use of motorized vehicles by vehicle type would be allowed on designated roads which include Pine Ridge Road and spurs, Midslope Road, and Lacks Creek Road.
- Where otherwise noted above the remaining public lands would be closed to motorized vehicle use, except for administrative and emergency uses.
- Firewood cutting and collection would be allowed by permit only.

Refer to Appendix A-4 for “standard operating procedures” that would be employed when implementing approved recreation management actions.

3.5.6 Visual Resources Management

Objectives: Manage the quality of the visual environment by maintaining Visual Resource Management (VRM) Classes 2 and 3 as described below:

Class 2: Areas to be managed under Management Class 2 are the old-growth ACEC, prairies, and oak woodlands. The objective of this class is to retain the landscape’s existing character. Management activities and uses can be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture in the predominant natural features of the characteristic landscape.

Class 3: The remainder of the management area would be managed under Management Class 3. The objective of this class is to partially retain the landscape’s existing character. The level of change can be moderate. Management activities and uses may attract attention, but should not dominate the view of the casual observer.

Management Actions:

- When projects or actions are proposed, a visual contrast rating would be conducted, if necessary, to ensure that they are designed and located to meet the area’s VRM objectives.
- Existing roads, culverts and other features would be inventoried for visual impacts and mitigating measures employed to reduce contrasts.

3.5.7 Fire Management

Objectives: Reduce the threat from wildfire to human life and property and to natural and cultural resources. Minimize impacts associated with large, high intensity wildfires, fire suppression activities and the public associated with prescribed fire activities. Enhance wildlife habitat, forest values, and native species diversity.

Management Actions:

- A full suppression policy would be implemented with a target of controlling at least 95percent of all unwanted fires during initial attack, in accordance with current BLM fire management policies.

- Due to the area's size, topography, and vicinity to private property, the Lacks Creek management area is not conducive to managing for Wildland Fire Use (allowing naturally occurring fires to burn within prescription to meet resources management objectives).
- Suppression actions on all wildfires within the Lacks Creek would use minimum impact suppression tactics (MIST). In so doing, the principle of fighting fire aggressively but providing for safety first would not be compromised.

Refer to Appendix A-5 for Standard Operating Procedures when implementing approved fire management actions.

Restrictions on heavy equipment (See Map 3-3 for spatial representation of restrictions identified below)

- Dozers and tracked equipment may create fireline on slopes under 20 percent, and along Pine, Beaver, and Dunn Ridges.
- Dozers and tracked equipment are restricted on slopes between 20-45 percent unless there is an immediate threat to life and property. Current or forecasted weather and National Fire Danger Rating System (NFDRS) indices shall be factored into the decision to use dozers and tracked equipment for fire suppression efforts on these slopes. The incident commander may elect to use these types of equipment if any combination of three of the following factors exist or are forecasted:
 1. 20 foot winds greater than 6 miles per hour.
 2. Temperature greater than 86 degrees.
 3. Relative humidity less than 29 percent.
 4. Energy Release Component (ERC) greater than 49.
 5. Burning Index (BI) greater than 44.
- Dozers and tracked equipment are entirely restricted on slopes exceeding 45 percent.

Provided the above slope restrictions are met, fireline may be created on decommissioned roads, but no decommissioned roads shall be re-opened or improved for equipment travel.

Prescribed Fire

- Prescribed fire would be used to support resource management goals related to vegetation, forest management, terrestrial and aquatic wildlife, and recreation. As a tool, prescribed fire may be used in conjunction with other methods (hand removal, heavy equipment, etc.) in order to achieve the most efficient method of reaching these goals. This would include pile burning slash residues resulting from forest management activities and re-introduction of fire into prairies, oak woodlands, and forests through low-intensity broadcast burning.
- Prescribed fire would be based on sound risk management, taking into account economic feasibility, the best science available, cooperation with other agencies and tribes, and consideration for public health and environmental quality. Not all the land within the Lacks Creek Management Area is expected to be burned, as risk management, logistics, and resource values may make prescribed fire untenable.
- Specific burn units and acreages shall be determined after thorough analysis of fuel loads, seral stages, and affected resources.

- Prescribed fire plans would be prepared for individual burns that would provide burn objectives, prescriptions, and contingency plans in case the prescription is exceeded or suppression action is needed.
- Burning would only occur with authorization from the North Coast Unified Air Quality Management District.
- Given the discontinuous nature of forest seral stages in the Lacks Creek Management Area, broadcast burns within forests would be small in size. Prescribed burns are not expected to exceed 400 acres, and most would be less than 100 acres. No more than 400 acres would be ignited by prescribed fire in any year in order to maintain a mosaic of seral stages within the management area.

3.6 Alternative 2

3.6.1 Cultural Resources Management

Objectives: Consistent with Section 110 of the National Historic Preservation Act, conduct a complete cultural resource inventory of the Lacks Creek Management Area.

Management Actions:

- Complete a Class III cultural resources survey of all accessible acres within the unit
- Locate, identify, and fully record all observed cultural resources.
- Complete cultural resource survey reports, site records, photography, and Global Positioning System (GPS)/Geographic Information System (GIS) data input.
- Submit all cultural resource documentation to the North Coast Information Center.
- Report on all related activities in annual BLM and State Historic Preservation Officer (SHPO) directed reports.

3.6.2 Fisheries, Riparian and Water Quality Management

Objectives: Same as Proposed Action

Management Actions:

Same as the Proposed Action except for the following:

- Erosion control efforts would be implemented over a seven year time period.
- Road PR1100 would be decommissioned and converted into a trail rather than remain as a public access road.

3.6.3 Wildlife Management

Objectives: Same as the Proposed Action with an increase in survey intensity and vegetation management practices.

Management Actions:

Same as the Proposed Action except for the following:
Northern Spotted Owl

- Conduct protocol surveys for spotted owls throughout the management area.

Marbled Murrelet

- Conduct protocol surveys for marbled murrelets throughout the management area.

Elk

- Increase elk foraging habitat through prairie restoration (see Vegetation Alternative 2).

Other Wildlife Species

- Conduct habitat assessments and surveys throughout the project area to determine use by BLM sensitive or other native species and determine necessary protective measures.

3.6.4 Vegetation Management (including Forest Management)

3.6.4.1 Prairies

Objectives: Maintain prairies at 2005 cover levels and reclaim prairies most recently lost to conifer encroachment to historical (1958) cover levels to provide an increased level of prairie cover within the mosaic of habitat types available to plants and wildlife.

Management Actions:

Same as the Proposed Action except for the following:

- Expand conifer/tanoak/forest vegetation treatments to the 1958 prairie footprint. Conifer removal may include removal of 50 year old trees of commercially valuable size.
- Increase level of mechanical equipment use to achieve objective: tools could include harvesting equipment, dozers, chippers grinders, etc.
- Observe and monitor recovery of native perennial grass species in reclamation areas. If recovery of desired grasses are not occurring; seeding and/or transplanting intervention may be applied.

3.6.4.2 Weeds

Objectives: Same as Proposed Action.

Management Actions: Same as the Proposed Action.

3.6.4.3 Forest Management

Objectives: Same as the Proposed Action but with more intensive meadow/grassland restoration as described in the Vegetation Alternative 2 section.

Management Actions: Same as the Proposed Action.

3.6.4.4 Special Forest Products

Objectives: Same as Proposed Action.

Management Actions: Same as the Proposed Action.

3.6.5 Recreation and Transportation Management

Objectives: Same as Proposed Action

Management Actions:

Same as the Proposed Action except for the following:

Road and Trail Access

Roads

- The Midslope Road would be decommissioned and converted into a trail. All-terrain vehicle access would be provided to the first large washout (three miles).
- No on-site borrow pits would be designated. All road-base materials would be purchased from off-site commercial sources.

Trail Improvements

West Side of Lacks Creek

- Construct approximately 20.0 miles of mountain biking trail separate from other use trails to provide a high quality riding experience and to avoid user conflicts. Specific locations for these trails are unknown at this time and would undergo separate environmental analysis.

East Side of Lacks Creek

- Construct approximately 3.0 miles of new multi-purpose non-motorized trail that would connect the end of the Pine Ridge Spur Roads to Pine Ridge Road.

Facility Development

- Develop up to 25 designated backcountry campsites for hikers and mountain bikers, and three designated horse camps. Each site would be cleared of vegetation if necessary, and include fire rings and appropriate signing. Hitch posts and developed water sources for animals would be provided at the horse camps where feasible. Development of these sites would be phased in depending on the rate of anticipated increased visitor use.

Regulations and Monitoring

- Overnight camping would be allowed throughout the area.
- Cross-country mountain bike and equestrian use would be allowed throughout the area.
- Campfires and power equipment would be allowed throughout the area, except during wildfire season when campfires would be subject to restrictions outlined in the Arcata Field Office Fire Restriction and Emergency Closure Plan.
- Conduct a visitor survey within five years of plan adoption.

3.6.6 Visual Resources Management

Objectives: Same as Proposed Action.

Management Actions: Same as Proposed Action.

3.6.7 Fire Management

Objectives: Same as Proposed Action.

Management Actions:

Same as the Proposed Action except for the following:

Restrictions on heavy equipment:

- Dozer use would be entirely restricted during wildfire suppression operations.
- Fireline construction would be limited to hand line, wet line and retardant line.

3.7 Alternative 3 – No Action Alternative

Under this alternative current management activities would continue following the guidelines identified in the 1995 Arcata Planning Area Proposed Resource Management Plan Amendment and Environmental Assessment (RMP/EA).

3.7.1 Cultural Resources Management

Objectives: Conduct cultural resource inventories as needed on a case-by-case basis for all proposed undertakings potentially effecting cultural resources. Currently there is very little information recorded pertaining to the location and character of historic properties/cultural resources within the Lacks Creek Management Area. The level of resource knowledge would persist except as improved upon through project-specific inventories.

Management Actions:

- Maintain current documentation of limited cultural resource records.
- Conduct additional cultural resource surveys on an as-needed-basis as projects are proposed.
- Provide no interpretation of known or potential cultural information for the watershed.

3.7.2 Fisheries, Riparian and Water Quality Management

Objectives: The 1995 RMP amendment put in place direction from the Northwest Forest Plan (USDA/USDI 1994) which includes a comprehensive Aquatic Conservation Strategy. The existing direction provides no measurable objectives for achieving the desired goals or a timeframe in which to complete watershed restoration (erosion control) projects.

Management Actions:

- Protect riparian reserves
- Implement watershed restoration

- Complete a watershed analysis (a watershed analysis for Redwood Creek was completed by Redwood National and State Parks (1997) but no erosion control projects were implemented in Lacks Creek)

3.7.3 Wildlife Management

Objectives: Manage Lacks Creek as a Late Successional Reserve, maintaining and enhancing habitat for late successional and old-growth related species, including special status species.

Management Actions:

- Comply and support the Fish and Wildlife Service recovery guidelines for the northern spotted owl.
- Protect marbled murrelet nesting habitat through Endangered Species Act consultation requirements.

3.7.4 Vegetation Management (including Forest Management)

3.7.4.1 Prairies

Objectives: Study prairies to learn the degree of species richness and composition and to document any unique floral assemblages or qualities that are currently unknown. Monitor natural changes in prairie cover/distribution. No authorized livestock use of prairies and incidental trespass from adjacent private lands minimized.

Management Actions:

- Gather species richness and composition data to determine a baseline.
- Determine frequency of incidental livestock trespass.
- Maintain gate closure on road access to Preston Prairie.
- Work with private livestock operator; notify operator immediately upon observation of livestock in Pine Ridge vicinity.
- Remove salt and watering facilities in Faulkner Prairie.
- Work with private livestock operator to develop stock water in "Hundred-Acre Field" to provide incentives for livestock to stay on private lands without the need for extensive fencing.
- Roads traversing prairies would be left in their current state.

3.7.4.2 Weeds

Objectives: Same as Proposed Action.

Management Actions: Same as the Proposed Action.

3.7.4.3 Forest Management

Objectives: Silvicultural treatments are not proposed beyond the present rate of implementation. The objectives of the forest management activities are the same as the Proposed Action.

Management Actions:

Pre-commercial thinning – 160 acres.

- Continue to pre-commercially thin approximately 40 acres each year for an additional four years.
- No increase the amount of pre-commercial thinning to be performed each year. Note: At this rate not all of the plantations would be thinned before they are too old and tall for a pre-commercial thinning to be silviculturally effective.

Hardwood conversion – 40 acres.

- Continue with the existing approved 40 acre hardwood conversion project which has been implemented on 10 acres. This project is presently being completed under an agreement with the Hoopa Valley Tribe.
- No additional hardwood conversion projects and acres would be identified for future implementation.

Commercial thinning – 0 acres.

- No commercial thinning would be completed. Note: With no commercial thinning planned the objective of accelerating the development of late successional forest characteristics would most likely not be met.

Oak woodland restoration – 0 acres.

- No oak woodland restoration projects would be completed.

3.7.4.3 Special Forest Products

Objectives: Same as Proposed Action.

Management Actions: Same as the Proposed Action.

3.7.5 Recreation and Transportation Management

Objectives: Management includes limited custodial management that would provide visitors with a minimal amount of dispersed recreation experiences and opportunities. Facility and trail developments would be limited to those necessary to provide for the health and safety of visitors and orderly recreation use.

Management Actions:

Road and Trail Access

Road Improvements

- Maintain Lacks Creek Road for 4WD vehicle use to the firewood sale area. Gravel the road where necessary and install vehicle barriers where the road intersects with abandoned access routes.
- Maintain Midslope Road for 4WD vehicle use to the first large washout approximately three miles from its intersection with Pine Ridge Road. Brushing, ditching, waterbarring,

and culvert cleaning would occur as needed to maintain safe travel conditions. Replace culverts as necessary to provide proper drainage and reduce the potential for soil erosion and sediment transport into streams.

- Small quantities (up to 10 yards per incident) of road base material would be obtained on-site from identified borrow areas (after necessary cultural & other clearances).

Trail Improvements

- Improve the trail from the end of Lacks Creek Road (firewood cutting area) to Lacks Creek where it connects into the abandoned logging road network. No other new trails would be constructed, improved, or maintained except for a 500 foot segment west of Falkner Prairie and east of Hundred Acre Field that would connect to the existing road network.

Interpretation/Education

- Develop an overall management brochure for the area.
- Install an information kiosk with a map of the area and use regulations at the intersection of Pine Ridge, Midslope, and Lacks Creek Roads.

Facility Development

- Develop a trailhead parking area for all vehicle types (excluding horse trailers) at the end of the Lacks Creek Road. Vehicle barriers, signs, fire rings, and a kiosk would be installed.
- Develop a designated horseback staging and camping area on Pine Ridge Road. This site would be widened and leveled to accommodate five horse trailers at any one time. Signs, kiosk, fire rings, and a hitch and post would be installed.

Regulations and Monitoring

- Overnight camping would be allowed throughout the area.
- Hiking, mountain biking, horseback riding, and other non-motorized recreation uses would be allowed throughout the area, including cross-country travel.
- Campfires and power equipment would be allowed throughout the area outside of fire season. During wildfire season, campfires would be subject to seasonal restrictions through the process outlined in the Arcata Field Office Fire Restriction and Emergency Closure Plan.

3.7.6 Visual Resources Management

Objectives: Same as the Proposed Action

Management Actions: Same as the Proposed Action

3.7.7 Fire Management

Objectives: Same as Proposed Action

Management Actions:

Same as the Proposed Action except for the following:

Prescribed Fire

- Prescribed fire shall be limited to pile burning to support forest management objectives.
- Prescribed fire plans would be prepared for individual burns that would provide burn objectives, prescriptions, and contingency plans in case the prescription is exceeded or suppression action is needed.
- Burning would only occur with authorization from the North Coast Unified Air Quality Management District.
- Pile burns are not expected to exceed 80 acres for any prescribed burn, and most would be less than 40 acres. No more than 80 acres would be ignited by prescribed fire in any year in order to maintain a mosaic of seral stages within the management area.

Chapter 4 – Environmental Affects

4.1 Introduction

This chapter evaluates potential environmental impacts that could occur to the natural and human environment from implementing each of the alternatives for the Lacks Creek Management Area. An impact is defined as a modification of the existing environment that is brought about by an outside action. Potential impacts considered in this chapter include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historical, cultural, economic, social, and health impacts (40 Code of Federal Regulations [40 CFR] 1508.8). This chapter is organized by resource topic and contains potential impacts that could result from implementing the objectives, allowable uses, and management actions under each of the alternatives. The baseline information used for determining the potential impacts are the current resource conditions described in the Affected Environment chapter.

4.1.1 Approach to the Analysis

The detailed impact analyses and conclusions are based on the BLM planning team members' knowledge of resources and the project area, reviews of existing literature, and information provided by experts from other agencies, interest groups, and concerned citizens. Data from field investigations were used to quantify effects where possible. However, in the absence of quantitative data, qualitative information and best professional judgment was used. Acreage calculations, projected use levels, and other numbers used in this analysis are approximate and provided for comparison and analytic purposes; they do not reflect exact measures of on-the-ground situations. Mitigation measures designed to avoid or reduce impacts were incorporated into the management alternatives and supporting information in the appendices, so impacts in this chapter are considered unavoidable and would result from implementing the management actions and mitigation. If an activity or action is not addressed in a given section, no impacts are expected or the impact is expected to be negligible, based on existing knowledge.

4.1.2 Impact Analysis Terminology

The analysis considers the context, intensity, and duration of an impact. The impacts consider a variety of contexts such as the affected region, the affected interests, the locality and the broader society. Intensity refers to the severity of the impact -- that is, the degree to which the action affects public health or safety or sensitive environmental resources. Duration refers to the permanence or longevity of the impacts, which is depicted as short-term or long-term. The terminology below is used in the analysis to help describe the relative level of impacts. Unless otherwise stated, the standard definitions for these impact related terms are as follows:

Negligible Impact: the impact is at the lower level of detection; there would be no measurable change.

Minor Impact: the impact is slight but detectable; there would be a small change.

Moderate Impact: the impact is readily apparent; there would be a measurable change that could result in a small but permanent change.

Major Impact: the impact is large; there would be a highly noticeable, long-term, or permanent measurable change.

Localized Impact: the impact would occur in a specific site or area. When comparing changes to existing conditions, the impacts would be detectable only in the localized area.

Short-Term Impact: the effect would occur only during or immediately after implementation of the action/allowable use, and would be reduced to no or negligible levels over the long-term.

Long-Term Impact: the effect could occur for an extended period after implementation of the action/allowable use. The effect could last several years or more.

Impacts presented are broad (within the management area), and long-term, unless otherwise noted as localized, or short-term/temporary. Impacts from implementing the plan include both negative and beneficial impacts to the natural and human environment. As impacts may be perceived as beneficial (positive) or adverse (negative) by different readers, these descriptors are qualified when used in defining impacts. However, in general, an action is considered to be beneficial or positive when it is contributing to achievement of the management direction identified under the Arcata RMP or other legislative and policy direction (e. g. ESA, PPZ requirements).

4.1.3 Cumulative Impacts

NEPA requires evaluation of an action's potential to contribute to "cumulative" environmental impacts. A cumulative impact is defined as: the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Cumulative impacts can result from similar projects or actions, as well as from projects or actions that have similar impacts (40 CFR 1508.7).

The objective of cumulative impact analysis is to evaluate the significance of the proposed action's contribution to cumulative environmental impacts. It is accomplished in three steps:

Step 1: Identify the cumulative impacts assessment area for each resource evaluated. The assessment area will vary by program. For example, for visual resources it would be the "viewshed", while for water quality it would be the area watershed(s).

Step 2: Identify and describe past, present, and reasonably foreseeable future actions in the cumulative impact study area that are similar to the proposed action or have substantial impacts to which the proposed action would contribute. The past and present actions are discussed in Chapter 3, Affected Environment, while the future actions are discussed in this chapter.

Step 3: Evaluate the interaction of the plan actions with these other past, present, and reasonably foreseeable future actions to contribute to cumulative environmental impacts.

4.1.4 Assumptions for the Analysis

Assumptions are made in the analysis regarding the level of land use activity, resource condition, and resource response. Potential impacts are determined partly based on these assumptions. The following assumptions were used in the overall analysis; additional assumptions are presented under each resource or use topic.

- Management actions proposed in the alternatives apply to public lands only. However, cumulative impacts analyses consider potential actions by individuals or entities other than the BLM.
- The alternatives would be implemented in accordance with all laws, regulations, and standard management guidelines/best management practices.
- Funding would be available to implement the alternatives.
- The level of activity on BLM-administered land is expected to increase, based on historical trends, population increases, and statements of interest in land use by individuals and industry organizations. This includes ongoing reasonable access to private land or interests.

4.1.6 Resources or Programs Where No or Negligible Impacts Would Occur

No impacts or negligible impacts to the following resources have been identified from implementing any of the plan alternatives: prime and unique farmlands, hazardous materials and solid waste, air quality, lands and realty, law enforcement/public safety, and environmental justice. Livestock grazing is used only as a management tool in specific vegetation management projects. Therefore, impacts related to grazing are only discussed in relation to vegetation management and not to a grazing program.

4.1.7 Impact analysis of Area of Critical Environmental Concern/Research Natural Area and Redwood National and State Parks Protection Zone Values.

The Lacks Creek Watershed ACEC (7,377 acres of BLM land) identifies the importance of Lacks Creek as a component of the Redwood National and State Parks Protection Zone (PPZ) and as a salmonid spawning stream, and highlights the need for special management in the watershed to restore impacts from past uses and to protect downstream park resources. The impacts to the ACEC and PPZ are the same as impacts to watershed values (since watershed protection is the primary goal for their designation) which are discussed in section 4.2 – Fisheries, Riparian and Water Quality.

The Lacks Creek Old Growth ACEC/RNA (1,620 acres of BLM land) encompasses the majority of the remaining late successional forest in the watershed. Under all of the alternatives, no stand interventions, recreation developments or other potentially impacting activities are proposed within the old-growth stands. Actions there would be limited to wildlife monitoring, so no impacts to this ACEC/RNA would occur under any of the alternatives.

4.1.8 Impact Discussion Organization

Effects from different management alternatives that could be implemented under the plan are considered by the following resource topics:

- 4.2 Climate Change
- 4.3 Soils
- 4.4 Cultural Resources
- 4.5 Social and Economic
- 4.6 Fisheries, Riparian and Water Quality
- 4.7 Wildlife
- 4.8 Vegetation (Except for Forest Management)
- 4.9 Forest Management
- 4.10 Recreation and Transportation Management
- 4.11 Visual Resources
- 4.12 Wild and Scenic Rivers
- 4.13 Fire

For each resource, the discussion includes a list of assumptions and incomplete information where applicable, followed by identification of direct and indirect impacts, and cumulative impacts (where applicable). In most instances, if a resource is not discussed under a particular section, it means that no or negligible impacts were identified for that resource. In a few instances where impacts might be expected, but a no/negligible impact determination was made, a rationale for the no impact conclusion is provided. Note that the discussions below contain slightly varying formats (some sections contain a more refined breakdown by topic). This breakdown depends on the nature of the resource/program and the level of detail needed to describe the various affects to the reader.

4.2 Climate Change

4.2.1 Introduction

Climate change affect analysis includes two components: 1) Impacts from implementing objectives and actions in the plan alternatives on carbon storage/emissions and climate change; and 2) Impacts of climate change on the resource conditions and effectiveness of implementing plan objectives and actions. Because climate change models are in their infancy regarding prediction of site specific impacts, the discussion of impacts for the plan alternatives is limited to qualitative descriptions and general acknowledgements. All affects of implementing plan actions would be cumulative in nature, so this section does not include a separate discussion of cumulative impacts.

4.2.2 Impacts from Implementing Plan Actions

The affects would be negligible, but mostly beneficial under all alternatives, with the highest beneficial impacts realized under the more intensive restoration programs proposed under

Alternatives 1 and 2. According to the Union of Concerned Scientists (2008), one key step to reducing the impacts of climate change on California ecosystems involves the creation and management of reserves that will provide plant and animal communities with room to adapt to the changing conditions created by a shifting climate. The purpose of the Lacks Creek ACEC/RNA and the overall direction for the Lacks Creek Management Plan under all alternatives would conserve/restore the area as a late successional forest reserve. Schulze et al, (2000) found that old-growth forests contain a larger volume of carbon in the woody biomass and soils than shorter rotation commercially harvested forest. The accelerated restoration of old-growth forest character in Alternatives 1 and 2 would result in a higher level of carbon sequestration than Alternative 3.

Each alternative provides for management activities that are anticipated to attract continued visitation to the area for motorized and non-motorized recreation activities (the highest visitation would occur under Alternatives 1 and 2). This access would result in continued greenhouse gas emissions as Lacks Creek visitation increases, but a net increase in overall greenhouse gas emissions would probably not occur. Visitor use levels are based on multiple factors including travel cost, opportunities for substitute activities and locations, demand for specific settings and benefits, etc. The provision of additional trails would allow local visitors access the Lacks Creek area instead of travelling to more distant destinations – therefore increased visitation could actually lower overall greenhouse gas emissions.

4.2.3 Impacts from Climate Change on Plan Objectives.

Based on current knowledge and climate models, achievement of the objectives and actions under the alternatives are considered to be feasible over the approximate 20-year life of the plan. For example, according to the Union of Concerned Scientists (2008), restoration efforts are even more important with climate change. Individual redwoods and other long-lived species may survive for centuries, even millennia-long past the point where climate changes make growth of new seedlings impossible. The same longevity of individuals that can mask the slow degradation of these forests can also provide time for restoration efforts. According to the California Climate Change Center (2006), a hotter climate could promote a much higher fire incidence in northern California by the end of the century by drying out and increasing the flammability of forest vegetation. This would increase the potential for catastrophic wildfires in the management area. The full suppression tactics and retention of access roads proposed under all alternatives would reduce the potential for catastrophic wildfire, especially when combined with vegetation management actions and associated fuel reduction. Also, the limitation of camping/fires to designated locations under Alternatives 1 and 2 would reduce the possibility of fire caused by recreational visitors. Increases in the amount of winter rains could intensify flooding and landslide hazards. The watershed restoration activities proposed under all alternatives would serve to reduce the impacts of more intense storm events.

In the event that additional information regarding climate change shows that a specific objective would be impossible to achieve, or not beneficial to ecosystem restoration, the plan would be amended accordingly.

4.3 Soils

(Note: The plan does not contain any “Soil Management” alternatives – Soil conservation measures are instead included under other programs (Fisheries, Riparian and Water Quality Management, Vegetation Management etc.)

4.3.1 Alternative 1

Impacts to soils from other programs

Establishing properly engineered trails to popular backcountry destinations will eliminate or reduce potential soil loss and the associated adverse water quality effects. Numerous studies have found that informal trails tend to cause more erosion than trails that have been properly aligned to avoid wetlands, riparian areas, and other sensitive soils. New trails would be designed to be hydrologically “invisible” and aligned to avoid wetlands and areas of easily eroded soils. Where trails must interact with water courses, stream fords would be the preferred approach when feasible, to minimize future maintenance needs and avoid the adverse watershed impacts associated with culverts. Trails that must traverse easily eroded soils and receive heavy use would be surfaced with crushed rock. Crushed rock surfacing of trails in highly erosive areas can greatly reduce soil loss. All trails with longitudinal gradients in excess of five percent would be constructed with frequent water bars to prevent the trail from capturing overland flow from up-slope which tends to result in rills or gullies on and downstream of the trail. All trails would be periodically inspected for signs of excessive erosion and resurfaced, reshaped, or realigned to correct drainage problems. All of these SOPs (Appendix A-4 Recreation) would ensure that impacts from trail construction would result in negligible impacts on soils.

Conversion of roads to trails would reduce erosion by reducing the amount of compacted ground surface, which will in turn reduce runoff volume and increase infiltration. Reduced runoff equates to less potential for overland flow to detach and transport soil particles into streams. Removal of fill perched above stream channels, excavation of failing and unnecessary stream crossings, and decompaction of abandoned road surfaces would also reduce runoff and mass wasting of soil into drainage courses.

Forest management activities would have minor impacts on soils since only existing skid roads would be used. Some minor compaction would occur from cabling trees onto the existing roads. Prairie restoration would help maintain these uncommon soil types within the management area.

4.3.2 Impacts under Alternative 2

Impacts from Other Management Programs:

Alternative 2 would have similar impacts to soils as Alternative 1. An additional 10 miles of mountain bike trails would result in soil disturbance and compaction on the new trail tread. However, the trails would be designed so that minimal off site erosion or compaction would occur. An additional 114 acres of prairie would be restored by removal of forest encroachment. This would serve to maintain a larger percentage of this uncommon soil type. The additional forest treatments to expand prairies and for forest stand improvements would impact a greater acreage than alternative 1, but impacts would still be minor. The accelerated watershed

restoration activities proposed under this alternative would not change the soil impacts (see Fisheries, Riparian and Water Quality section for potential sedimentation impacts).

4.3.3 Impacts under Alternative 3 (no action)

There would be no trail construction and negligible impacts from a small acreage of forest treatments within this alternative. The prairie soils would continue to be encroached upon by conifers and acidify unless a natural disturbance (wildfire) caused them to expand. A smaller number of road decommissioning projects would be implemented, reducing the beneficial impact of restoring compacted soil from roads.

4.4 Cultural Resources

4.4.1 Assumptions and Incomplete Information

Assumptions for the analysis:

- The BLM would review all proposed ground disturbing undertakings and use authorizations on public land pursuant to the State Protocol Agreement among the BLM California State Director, the California and Nevada SHPO; Section 106 of the National Historic Preservation Act (NHPA); NEPA; and the American Indian Religious Freedom Act.
- Standard BLM policy will be followed to implement field inventory and identification of cultural resource sites within a proposed project area of potential effect (APE) for all ground-disturbing undertakings.
- Any actions proposed on public land will require an evaluation of (1) the potential for presence of important cultural resources, (2) the potential impacts to cultural resources where project actions may cause surface disturbance or provide access to cultural resources, and (3) the appropriate mitigating actions to protect cultural resources, including project avoidance, redesign, and if necessary, data recovery.
- Avoiding impact, whenever possible, to National Register and Traditional Cultural Properties is a standard management practice. This could involve avoidance of sites by means of project design or redesign, fencing, capping or other protective measures.
- BLM personnel and law enforcement will continue to have an on-the-ground presence to monitor/protect sites from illegal and inadvertent public impacts.
- Site protection priority will be focused on National Register eligible and Traditional Cultural Properties.
- National Register Property or site/Historic Property/Archaeological Property/Cultural Property/Traditional Cultural Property are synonymous by legal definition (key word is property). Cultural properties are either eligible or listed on the National Register of Historic Places.
- For the treatment of historic properties where preservation, rehabilitation, restoration, and reconstruction are involved, all actions will be pursuant to Secretary of the Interior Standards (36 CFR, Part 68).

Incomplete information

To date the BLM has recorded 532 acres of cultural resource field inventory of public land in the Lacks Creek Management Area. This represents six percent of the 8,673 acres within this unit, a small percentage relative to other public land units. Specific cultural inventory is not available to provide a comprehensive understanding of the types of cultural resources (prehistoric and historic) and the levels of cultural sensitivity within the upland and valley landscape zones.

Only five historic properties in the management area have been located, none have yet been determined eligible, listed or nominated for inclusion to the National Register of Historic Places. Due to the limited inventory in the area to date no other cultural resources have yet been identified or evaluated for eligibility to the National Register.

There have been no archaeological excavations carried out in the management area.

4.4.2 Alternative 1

Impacts from Cultural Resource Management

The development of a protocol agreement in the Lacks Creek Management Area with the Native Americans to implement the statewide policy regarding traditional plant gathering and cultural practices would have no impact on cultural properties. However, the recovery and use of native plants used traditionally for domestic, medicinal and for ceremonial rites would be beneficial to the indigenous people and the trust responsibilities between the native people and BLM.

Implementation of intensive and mixed sample cultural resource inventories (no surface disturbance) on any additional land in the management area will have no ground-disturbing impacts on cultural properties. However, those actions will be beneficial to cultural resources by identifying the location and condition of prehistoric and historic resources to be managed and protected pursuant to the BLM/SHPO State Protocol.

The development and implementation of a Cultural Resource Project Plan for restoring, rehabilitating, stabilizing or reconstructing National Register eligible sites would be beneficial to the preservation of cultural properties as part of the BLM/SHPO Historic Preservation Program.

The development and use of procedural agreements with the Native American community would be an on-going effort throughout the life of the plan and consist of actions such as:

- 1) Meetings with tribal governments and other Native people with cultural ties to the management area will be an open and on-going process to enhance trust responsibilities.
- 2) Any future excavations and data collection would be implemented to avoid impacts to sites containing burials and/or sacred objects subject to the Native American Graves Protection and Repatriation Act.
- 3) Monitoring of archaeological sites of Native American origin would be available for Native American monitoring pursuant to coordination between the BLM and the Native Americans

having cultural ties to the management area. The site stewardship effort would track the condition of sites being affected from natural and human causes for purposes of site preservation.

Impacts from Wildlife Management

Research and inventory of present and foreseeable future wildlife projects will result in no impact to cultural resources as research actions will be required to avoid impacts to cultural properties. Native Americans may look favorably upon the expansion of habitat of native animals (elk) associated with the traditional use of lands in the management area.

Impacts from Vegetation Management

Under the preferred alternative grazing would continue in prairie areas. Thus, the potential for impact to cultural properties would continue and the impact intensity would range from negligible to minor. The dispersed nature of livestock grazing creates difficulties in identifying areas of potential disturbance due to livestock. Locations where livestock congregate or traverse across cultural resources could potentially result in the displacement of artifacts and features as well as mixing of site deposits and disruption of contexts. Livestock trampling or congregating at water sources and salt licks could denude vegetation cover and increase compaction, creating potentially indirect impacts on cultural resources by accelerating erosion and exposing artifacts to illegal surface collection and feature displacement. These impacts could potentially range from negligible to moderate but would be localized to individual sites. Mitigation through appropriate treatment such as soil stabilization or fencing to exclude cattle from sensitive areas will be applied as part of BLM/SHPO Supplemental Procedures for Grazing Permits/Leases. However, standard cultural procedures would be implemented and the supplemental procedures for livestock grazing in the BLM/SHPO State Protocol would be applied to monitor and identify impacts. If impacts are identified, appropriate mitigation measures would be applied to protect cultural properties.

The implementation of prescribed burns and manual removal of vegetation to restore prairies would have no impact to cultural resources as standard cultural procedures would be implemented to ensure that projects are designed so that no impact occurs.

Impacts from Forest Management:

Projects to restore natural stand character and late successional forest attributes would have no to negligible impacts on cultural resources, as project design would include cultural clearances and project modifications to ensure that impacts do not occur.

Impacts from Watershed Fisheries and Riparian Management

A potential impact to cultural properties under road removal and upgrading/maintenance is ground disturbance activities with heavy equipment. Potential impacts to cultural properties could occur should road upgrading or removal cut across a cultural property. Secondary impacts from road erosion could cause impacts to cultural properties so restoration/upgrading activities will also have beneficial impacts. With implementation of the standard cultural procedures to inventory, identify and avoid cultural properties, negligible to no impact to cultural properties is anticipated.

Impacts from Fire Management:

For prescribed fire and fuels management there would be no impact to cultural resources properties anticipated as the standard cultural resource procedures and site avoidance measures will be identified and employed in advance of fire operations under all alternatives.

The emergency nature of wildfire can lessen management ability and priority to protect cultural resources. Surface and subsurface disturbing impacts on cultural resources from wildfires are largely associated with fire suppression activities. Suppression activities have a considerable potential to damage prehistoric and historic sites through hand and bulldozer construction of fire lines, clearing for helicopter pads, fire camps and related activities. Fire camps and staging areas in or near known or unidentified prehistoric or historic sites may be facilitate illegal collection of artifacts and displacement of cultural features. For fire suppression activities, impacts to cultural properties could potentially range from minor to moderate.

Impacts from Recreation Management

Conversion of existing roads to various recreation trails may threaten as yet unknown cultural resources. All ground-disturbing activities will be preceded by appropriate Class III cultural resource inventories to identify and protect cultural resources as necessary.

Resource information displays will be provided to educate visitors about past land use practices in the management area, resulting in improved appreciation of these resources.

The implementation of directional signs at major intersections will not impact cultural properties as the standard cultural procedures, including advance field inventory and identification of eligible cultural properties will be completed prior to ground-disturbing activities.

Activities associated with inadvertent disturbance by recreational visitors, unauthorized off-road travel, vandalism, and illegal artifact collection could result in a loss of cultural resource information. As most public use activities are dispersed on the landscape and do not require permitting, discovered impacts will be mitigated on a case-by-case basis as they are discovered. Since most of the management area is forested, illegal off-road travel is only possible in specific areas (such as oak woodlands and prairies)

Trail maintenance where ground disturbance takes place could potentially impact cultural properties should the trail cross a site. Secondary impacts from trails to cultural properties could occur from soil erosion or the illegal collection of artifacts or displacement of cultural features where a site is within or adjacent to a trail. However, with implementation of standard cultural procedures to avoid sites, negligible to no impact is anticipated.

4.4.3 Alternative 2

Impacts from Cultural Resource Management

Impacts would be similar to Alternative 1 except that a Class III cultural resources survey of all accessible acres within the unit would be completed. Also, all observed cultural resources would be fully recorded. This would increase the knowledge and understanding of cultural resource values over Alternative 1. However, it would only offer a negligibly higher level of protection to these resources over alternative 1 at a much higher expense. This is due to two factors: 1) the nature of the sites (lithic scatters that are not highly visible), and 2) the area is heavily forested and most visitors will confine their activities to developed trails which have already been cleared/recorded.

Impacts to Cultural Resources from Other Programs

Impacts to cultural resources would be the same as Alternative 1, since project design would include cultural clearances and project modifications to ensure that impacts do not occur.

4.4.4 Alternative 3 (no action)

Impacts from Cultural Resource Management

Projects would be cleared prior to surface disturbance, but no proactive cultural inventories would be conducted under this alternative, resulting in less beneficial impacts (i. e. gaining knowledge about the history and prehistory of the management area.)

4.4.5 Impacts to Cultural Resources from Other Programs

Less surface disturbing projects are proposed under this alternative. However, impacts to cultural resources would be similar to Alternative 1, since project design would include cultural clearances and project modifications to ensure that impacts do not occur.

4.4.6 Cumulative Impacts

Assessment Area: Redwood Creek Watershed

Past, Present and Reasonably Foreseeable Future Actions and Cumulative Affects

The National Park Service completed a cultural context document for Redwood National and State Parks. Although this document is approximately 25 years old, it is the most complete assemblage of cultural information in the assessment area. The U.S. Forest Service also has compiled project related cultural inventories for the Six Rivers National Forest and the Hoopa Tribe conducts and documents inventory data on Tribal lands. Although private timber companies are required to conduct site clearances as part of their Timber Harvest Plan approval process, this is not public information. The completion of a cultural context document for Lacks Creek under Alternatives 1 and 2 would complement the efforts ongoing in the other public/tribal trust lands surrounding the management area. This would add substantially to knowledge about prehistoric and historic use in the region.

4.5 Social and Economic Impacts

4.5.1 Introduction

A number of groups and factors associated with the social and economic well being of the region would be affected by implementation of the Lacks Creek Management Plan alternatives. Groups include neighboring landowners and other local rural residents of Redwood Valley, the Hoopa Tribe, and recreation visitors from other parts of the county and tourists from outside the area. Other factors include the social and economic goals of the county as expressed through various county plans and policies. The impacts are discussed in relation to these groups and factors since they would be affected in different ways.

4.5.2 Impacts from Management Programs under Alternative 1 – Proposed Action

Recreation use of up to 4000 visitors per year would result in traffic increases of approximately 2000 vehicles annually on Bair Road. This use would peak on weekends in the spring, summer and fall months, where up to 30 additional vehicles per day could use the roads. This use level is well below the design capacity of the road system, but would still cause some minor impacts to local residents who are used to present traffic volumes. The increased visitor access also would result in some potential for private land trespass. However, experience in similarly managed areas in the region shows that visitors normally stay on existing trails in forested settings – especially where proper information and signing is provided as is proposed under this alternative. Also, the restriction of vehicle access within the management area to one primary entrance, and the gating/blocking of access corridors into private lands would minimize trespass potential.

The development of a trail network would enhance recreation opportunities for visitors and residents to Humboldt County. As stated in the Affected Environment chapter, this is a stated goal in the Humboldt County economic development strategy which lists tourism as a core economic driver in the county. The trail network would provide an additional quality of life amenity to county residents as well, since dispersed recreation opportunities (especially for mountain biking and equestrian users) are somewhat limited in the immediate area.

Lacks Creek would continue to provide access for tribal members for outdoor recreation including hunting. Also, forest stewardship contracts would offer increased opportunities for BLM partnerships with the tribe. The by-products of forest stewardship would include up to 300 cords of firewood per year and a small volume of sawlogs from commercial thinnings. These products would provide minor positive benefits to the area economy. The restoration of area fish habitat would help contribute to regional efforts that are being taken to offset some of the economic impacts suffered by the local salmon industry. The restoration of late successional habitat would serve to maintain Lacks Creek as a reserve in an area with intensive commercial timber production.

Most watershed and forest restoration projects would be completed through cooperative agreements and contracts that would fund local firms and organizations, providing direct economic benefits to the county.

4.5.3 Impacts under Alternative 2

Impacts would be similar to those under Alternative 1, except for an estimated 10 percent additional recreation use traffic from the increased trail system. Also, a slightly larger amount of cordwood and sawtimber would be provided as a byproduct of expanded restoration actions.

4.5.4 Impacts under Alternative 3 (No Action)

Traffic volumes on county road systems would increase at a much lower rate, and remain near present levels. The economic benefits of trail development, forest and watershed restoration would be minimal.

4.5.5 Cumulative Affects

Assessment Area: Humboldt County

Past, Present and Reasonably Forseeable Actions and Cumulative Effects: The Humboldt county economy has undergone a transition during the past 20 years from a timber-agricultural-fishery based economy (which have declined), to a more diversified economy. Implementation of the Lacks Creek Management Plan, especially Alternatives 1 and 2, would have minor beneficial impacts, both on the traditional industries (through forest and fishery restoration), and the diversification (through dispersed recreation and associated quality of life/tourism benefits).

4.6 Fisheries, Riparian, and Water Quality

4.6.1 Impacts under Alternative 1 (Proposed Action)

Impacts from Fisheries, Riparian, and Water Quality Management

The proposed action includes both road upgrading and road decommissioning. Both of these actions require the use of heavy equipment and both actions are ground disturbing in nature.

A. Road Upgrading

Potential impacts of road upgrading include temporary increase in sediment yield and water turbidity, possible introduction of toxics such as fuel or lubricants into watercourses, and minor removal of riparian vegetation.

Sediment and Turbidity

Culvert replacement, installation of new culverts, road shaping, and road drainage improvements require movement of road material in and near stream channels. The roads chosen for upgrading are generally located in the upper portions of the hill slopes and include very few large stream crossings. Operations criteria require that heavy equipment use all feasible techniques to prevent sediment from entering stream channels. In addition, any culvert replacements would occur only during the dry season of the year when streamflow is either absent or minimal. It is impossible to completely prevent sediment from entering stream channels during culvert replacement due to the proximity of earth moving activities to the channels. However, qualitative observations of the effectiveness of the above operations criteria by BLM personnel have shown them to be effective at keeping introduction of sediment to a minimum. Thus, short-term temporary increase in

sediment yield and turbidity due to road upgrading activities is expected to have negligible effects on fish and water quality.

In the long-term, road upgrading is expected to both reduce the possibility of episodic large scale erosion from roads and reduce the need for road maintenance activities. Reducing the possibility of large scale erosion would have a minor to moderate positive impact on water quality and fish since the possibility of large scale erosion from the road chosen for upgrading may be relatively small but the impacts of a large erosion event could be large. Reducing the need for road maintenance activities would have a negligible to minor positive impact on water quality and fish since such activities on the roads chosen for upgrading pose only a small risk towards increasing sediment yield or turbidity.

Toxics

Heavy equipment such as excavators, backhoes, dozers, and dump trucks require the use of diesel fuel and hydraulic fluid. Both of these substances can be toxic or harmful to aquatic and riparian-dependent organisms in various concentrations. Operations criteria require that equipment be inspected daily for leaks of fuel or hydraulic fluids and not be used until all leaks are repaired. In addition, absorbent pads (or equivalent) are required to be onsite in case any leaks occur during operations. Employing these criteria is expected to make the possibility of toxics reaching any aquatic or riparian dependent species to small as to be negligible.

Riparian Vegetation

The roads chosen for upgrading contain very few large stream crossings and are generally higher in the watershed compared to those roads chosen for decommissioning and thus these road routes contain very little in the way of riparian vegetation. Replacement of existing culverts at stream crossings has a high probability of removing riparian vegetation. Riparian vegetation could be removed at stream crossings during the excavation of the existing culverts. It is likely that this vegetation would be relatively young since it is probably the vegetation which has grown since the original culvert was placed during road construction. Thus, only a minor amount of riparian vegetation is expected to be removed during road upgrading. Impacts from this removal of a minor amount of vegetation on fish, water quality and riparian vegetation are expected to be negligible. Water temperature is not expected to be effected by this impact since most stream channels along these road routes are dry during summer months and the total amount of vegetation expected to be removed is minor. Since riparian vegetation in Lacks Creek tends to be fast growing species such as red alder, the duration of any impacts is expected to be short-medium term, lasting up to five to ten years.

B. Road Decommissioning

Potential impacts of road decommissioning include temporary increase in sediment yield and water turbidity, possible introduction of toxics such as fuel or lubricants into watercourses, minor removal of riparian vegetation, and possible increase in maximum summer water temperatures.

Sediment and Turbidity

Excavation of stream crossings during the road decommissioning process requires heavy equipment such as excavators and dozers to work in or near stream channels. The roads chosen for decommissioning tend to be near larger stream channels and the mainstem of Lacks Creek

since these are the roads that pose the greatest risk of failure and large scale erosion. Operations criteria require that heavy equipment use all feasible techniques to prevent sediment from entering stream channels. In addition, road decommissioning would occur only during the dry season of the year when streamflow is either absent or minimal. After work is completed areas of bare soil would be mulched with native vegetation or straw. It is impossible to completely prevent sediment from entering stream channels due to the proximity of excavations to stream channels thus it is expected that a minor amount of sediment would reach stream channels during decommissioning.

During the winters following excavations, the newly excavated channels may experience adjustments and bank erosion. Although the exact amount of channel adjustment and corresponding erosion from individual stream crossing excavations cannot be reliably predicted, investigations of stream crossing removals in the Redwood Creek watershed provide estimates of average adjustments. Research conducted in Redwood Creek (Klein 1987; Madej 2001) found the amount of post-treatment erosion from stream crossings to be highly variable and related to the size of the crossing and the stream power associated with the crossing, with an average of approximately 22 cubic yards per crossing delivered to stream channels following excavation (Klein 1987). Given the expected number of crossings to be excavated over the first five years of plan implementation, roughly 600 to 2,200 cubic yards in post-excavation erosion could be yielded from these crossings. Depending on the timing of this yield (whether it is yielded all at once during a very large storm or whether it is yielded in small amounts for several years) this would mean a minor effect on water quality and fish. Turbidity is likely to have a minor increase during and after storm events for the first two to three years following treatment. An increase in fine sediment deposited in spawning gravel can reduce interstitial water flow, leading to depressed dissolved oxygen concentrations, and can physically trap emerging fry in the gravel at very high concentrations (Hicks *et al.* 1991). Approximately one mile of the 24 total miles of road decommissioning will occur within approximately ½ mile of the range anadromous fish species. The great majority of the decommissioning work will be over one mile away from anadromous fish habitat. Increased turbidity and sediment yield of this magnitude during winter months may have a negligible impact on incubation of salmonid eggs depending on the location of the erosion to the spawning areas located in the lower 4.5 mi of Lacks Creek, the abundance of eggs, and the developmental stages of those eggs.

Road decommissioning could prevent hundreds of thousands of cubic yards of sediment from being yielded into Lacks Creek in an episodic nature. This would provide a substantial long-term beneficial impact to fish, water quality, and riparian resources. Reduction of sediment yield would allow a decrease in stored bedload within Lacks Creek and a general long-term improvement of habitat for native aquatic and riparian-dependent species.

Toxics

Heavy equipment such as excavators, backhoes, dozers, and dump trucks require the use of diesel fuel and hydraulic fluid. Both of these substances can be toxic or harmful to aquatic and riparian-dependent organisms in various concentrations. Operations criteria require that equipment be inspected daily for leaks of fuel or hydraulic fluids and not be used until all leaks are repaired. In addition, absorbent pads (or equivalent) are required to be onsite in case any

leaks occur during operations. Employing these criteria is expected to make the possibility of toxics reaching any aquatic or riparian dependent species to small as to be negligible.

Riparian Vegetation

The roads chosen for decommissioning are lower in the watershed and tend to have more large-sized stream crossings compared to the roads chosen for upgrading. Since none of the road mileage is routed directly adjacent to a stream channel, however, only a minor amount of riparian vegetation is included within the road routes. Excavations of stream crossings are the activity that has a highest probability of removing riparian vegetation. Riparian vegetation is likely to be removed at stream crossings during the excavation of stream crossings. It is likely that this vegetation would be relatively young since it is probably the vegetation which has grown since road construction. Thus, a minor amount of riparian vegetation is expected to be removed during road decommissioning. Impacts from this removal of a minor amount of vegetation on fish, water quality and riparian are expected to be negligible.

Water Temperature

Given that a minor amount of riparian vegetation would be removed mostly on streams which are dry during summer months, the chances of any impacts to summer maximum water temperature increase is negligible.

Impacts From Wildlife Management

Proposed management actions include conducting surveys and monitoring bird and mammal species. These activities would not alter any landscape components or processes which affect fish habitat, riparian resources, or water quality. Thus, no impacts are expected.

In addition habitat improvement activities are proposed which are described in detail in the Forest Management Proposed Action and thus the impacts of those activities will be described in the Forest Management section.

Impacts from Vegetation Management

A. Prairies

Proposed management actions include mechanized removal of conifers, prescribed burning, targeted grazing, and disking of roads. Potential impacts from these activities include temporary increase in sediment yield, temporary increase in water turbidity, and possible introduction of toxics such as fuel or lubricants into watercourses.

Sediment and Turbidity

Grazing and disking of roads in prairies are ground disturbing activities and could potentially cause introduction of sediments if such activities were conducted near stream channels. The prairies in the management area are generally a great distance from the mainstem of Lacks Creek and do not contain stream channels. Thus no impacts to sediment and turbidity are expected from the proposed management actions.

Toxics

Use of heavy equipment for road diskings and use of chainsaws and gas-powered chippers for conifer removal require the use of fuels and lubricants. Leaks or spills of fuels or lubricants occurring near stream channels or riparian habitat could result in impacts to fish or riparian dependent species. The prairies in the management area are generally a great distance from the mainstem of Lacks Creek and do not contain stream channels. Thus the probability of toxic materials reaching a stream channel or riparian area is so low as to be negligible.

B. Forest Management

Proposed management actions include pre-commercial thinning (445 acres), commercial thinning (331 acres), hardwood conversion (340 acres), and oak woodland restoration (253 acres). Potential impacts from these activities include temporary increase in sediment yield, temporary increase in water turbidity, and possible introduction of toxics such as fuel or lubricants into watercourses, as well as modification of riparian vegetation.

Pre-Commercial Thinning: Pre-commercial thinning involves cutting trees 8 inches or less in diameter using chainsaws, and either lop and scatter or pile and burn slash. Pre-commercial thinning may be conducted within riparian reserves as necessary to accelerate growth and help to achieve Aquatic Conservation Strategy Objectives (Northwest Forest Plan Standards and Guidelines for Timber Management guideline TM-1(c)) (BLM-USFS, 1994). Any burn piles would be located outside of riparian reserves.

Toxics

Re-fueling of saws would be conducted outside of riparian reserves and chainsaws would be inspected for leaks daily prior to use. During chainsaw operations within riparian reserves the possibility exists of fuel leaking. Given that the saws will be inspected prior to operation and that chainsaws do not hold large amounts of fuel, the possibility that enough toxic material could be introduced into a riparian area or stream channel is negligible.

Riparian

Cutting small diameter trees within riparian areas would be conducted only for the purpose of accelerating growth of riparian trees and helping to achieve large wood debris objectives of the Northwest Forest Plan. Pre-commercial thinning in dense riparian stands would make more resources available to the remaining trees for growth. Treatments would not be of sufficient magnitude to reduce riparian shading or increase water temperatures. Long-term impacts would be to increase the component of large conifers within the riparian areas.

Commercial Thinning: Commercial thinning involves cutting and removing trees 20 inches or less in diameter. Removal would be conducted using heavy equipment on existing roads. Heavy equipment would be excluded from entering riparian reserves. Slash would be either lopped and scattered or piled and burned outside riparian areas. Commercial thinning may be conducted within riparian reserves as necessary to accelerate growth and help to achieve Aquatic Conservation Strategy Objectives (Northwest Forest Plan Standards and Guidelines for Timber Management guideline number TM-1(c)) (BLM-USFS-1994). The possible introduction of toxics and the effects on riparian areas from this management action would be exactly as described above for pre-commercial thinning.

Sediment and Turbidity

Removing fallen trees using heavy equipment is a ground disturbing activity. Heavy equipment tracks can disturb native soils. Dragging fallen trees to a road or landing can also disturb native soils. Loosened soil can be transported to stream channels and riparian areas during subsequent rainfall. The probability that sediment would enter a stream channel or riparian area depends on the amount of exposed soil, the proximity to a stream channel, the slope, intensity of rainfall, and the amount of vegetation buffer between the exposed soil and the stream channel.

Three of the four units proposed for commercial thinning are located solely on ridgetop locations with no stream channel present and thus no potential sediment or turbidity impacts are expected in these units. Only the northern most unit has stream channels within it. Since heavy equipment would be excluded from riparian reserves the only potential impact would come from dragging trees out of riparian areas. It is assumed that the necessary number of trees which would be removed would be highly variable depending on tree density and growth, thus the potential amount of exposed soil would be variable. However, it is expected that the amount of ground disturbed from dragging trees from riparian reserves will be minor and that vegetative buffers will always be present. Thus, the impact on fish and water quality due to increased sediment and turbidity from commercial thinning is expected to be negligible.

Hardwood Conversion: The impacts from hardwood conversion to fish, water quality, and riparian would be the same as described above for pre-commercial thinning since the nature of the activities are very similar.

Oak Woodland Restoration: None of the units proposed for oak woodland restoration are proximal to stream channels. The activities proposed are not ground disturbing in nature. Thus no impacts are expected from this management activity.

C. Special Forest Products

This management action includes mushroom collecting, vegetation collecting, and fuel wood removal. Of these, the only activity with a possible impact to fish, water quality, and riparian resources is fuel wood removal. Fuel wood removal is not permitted to occur within riparian reserves (Northwest Forest Plan) and would only be conducted to clear existing roads or assist with forest restoration projects. Thus, the possibility that any impacts would occur in relation to this activity is negligible.

Impacts from Cultural Resources Management

Under this alternative, existing policies would remain in place to protect cultural resources, and could result in minor impacts on road removal activities. All projects would be surveyed for cultural resources and if any are discovered the treatment area or project must be designed to protect the cultural resources. This could have a minor negative short-term impact on restoration activities and management activities would be restricted, delayed or modified to protect the cultural resources.

Impacts From Recreation and Transportation Management

Proposed management actions include road upgrading, trail construction, development of interpretive materials, and facilities development. The impacts of road upgrading and the 7.5 miles of road to trail conversion are discussed within the Fisheries, Riparian, and Water Quality Management section. Development of interpretive materials does not alter any landscape components or processes which affect fish habitat, riparian resources, or water quality and thus no impacts are expected from this component of the recreation management actions.

The remaining activities are the construction of five miles of new hiking trail, ten miles of new mountain bike trail, and the development of facilities such as parking areas, small campgrounds, and an equestrian staging area. The other potential impacts to be discussed are the impacts of visitor use.

New Trail Construction

Construction of new trail routes will be conducted using hand crews following the Standard Operating Procedures (SOP) in Appendix A-4. The SOP details low impact trail construction techniques such as minimizing disruption of hydrologic flow paths, minimizing disturbance to riparian areas, and construction of outsloped trails. The potential impacts from new trail construction include a temporary increase in sediment yield and water turbidity, the possible introduction of toxics such as fuel or lubricants into watercourses, and the modification of riparian vegetation.

Sediment and Turbidity

Trail construction is a ground disturbing activity which could potentially cause the introduction of sediments if such activities were conducted near stream channels. Given the proposed trail routes (see Map 3-2) only a small fraction of the trail routes intersect stream channels. Given the use of hand tools, the SOP, and the proposed location of the trail routes, it is likely that the amount of sediment entering the stream channel and any potential increase in turbidity would be so small as to be negligible. Any impact would be short-term in response to heavy rainfall and is not expected to persist beyond the first winter following trail construction.

Toxics

Chainsaws and other small engine power tools could be employed to construct trails in some locations. Re-fueling of power tools would be conducted outside of riparian reserves and would be inspected for leaks daily prior to use. During power tool operations within riparian reserves the possibility exists of fuel leaking. Given that these tools would be inspected prior to operation and that they do not hold large amounts of fuel, the possibility that enough toxic material could be introduced into a riparian area or stream channel is negligible.

Riparian

A small fraction of the trail routes intersect stream channels (see Map 3-2) and construction activities are designed to minimize riparian disturbance. Thus, a negligible amount of riparian vegetation is expected to be removed during road upgrading. Impacts from this negligible amount of vegetation removal on fish, water quality and riparian are expected to be immeasurable. Water temperature is not expected to be affected by this impact since most stream channels along these trail routes are dry during summer months and the total amount of

vegetation expected to be removed is negligible. Since riparian vegetation in Lacks Creek tends to be fast growing species such as red alder the duration of any impacts are expected to be short-medium term, lasting up to five to ten years.

Facility Development

Trailhead parking and pull-in campsites on the Midslope Road and Pine Ridge Road require minor changes to existing roads and spur roads. The location of these roads is outside of streams and riparian areas and thus no impacts are expected.

Development of a trailhead campground at the end of Lacks Creek Road would entail some minor vegetation removal, minor road improvements, installation of barriers, and construction of a primitive toilet. The area is located approximately 0.25 miles from the headwaters of Lacks Creek. The area is flat and suitable for parking and camping with minimal ground disturbance. One small spring is located nearby. The toilet would be primitive, sited in a location not connected to water (with waste stored/pumped from a waterproof vault), and thus no impacts from constructing or use is expected. The potential impacts of this facility are road upgrading (improvements) which is discussed in the Fisheries, Riparian, and Water Quality Management section.

Designating up to 15 backcountry campsites would require some minor vegetation removal and, in some cases, construction of small rock impoundments around water sources. Water sources cited in this action could include non-fish bearing streams as well as springs.

Thus potential impacts of facility development not already discussed in other sections include water impoundment near campsites. Impoundments are expected to hold only a few gallons of water for a short period of time and thus impacts are expected to be negligible.

Impacts from Fire Management

Fire Suppression

Impacts from fire suppression would vary greatly depending on the fire behavior, fire timing, as well as intensity of suppression. Thus, specific impacts of fire suppression cannot be estimated and are beyond the scope of this analysis. Impacts may include an increase in sediment entering stream channels, increases in turbidity, introduction of retardants into water courses, and modification of riparian vegetation. An emergency stabilization and rehabilitation plan would be completed after any major fire incident and would outline restoration actions.

Restrictions of heavy equipment as well as the SOPs outlined in Appendix A-5 would minimize any impacts to fisheries, riparian, and water quality. Given the growth rate of vegetation in the Lack Creek area any impacts are expected to last from five to ten years. Most impacts would be short-term and temporary in nature.

Prescribed Fire

Although locations of prescribed burns have not been determined, the three potential impacts to fisheries, riparian, and water quality are: increased sediment into stream channels, increased

turbidity, and modification of riparian vegetation. Sediment and turbidity could come from increased areas of bare soils and production of ash following a fire. If riparian vegetation were allowed to burn, some trees would likely die and some may be damaged.

Sediment and Turbidity

Areas of bare soil and ash produced through burning could be transported into stream channels by rainfall events. Introduction of these materials could cause a temporary increase in turbidity and potentially impact fish and fish habitat. However, given the burning conditions under which a prescribed fire would be allowed to occur, the amount of bare soil is expected to be negligible and thus the potential for any soil reaching a stream channel would also be negligible. The amount of ash produced during such burning conditions is expected to be minor and ash is not easily transported to stream channels. Thus the potential impacts of this management activity on sediment and turbidity are negligible.

Riparian

Given the burning conditions under which a prescribed fire would be allowed to occur, the amount of riparian vegetation which would die is expected to be negligible. Thus the potential impacts of this management activity on riparian resources are negligible.

4.6.2 Impacts under Alternative 2

Impacts from Fisheries, Riparian, and Water Quality Management

The difference between the proposed action and Alternative 2 is primarily the amount of time which the activities would be completed. The reduced time period for restoration actions under this alternative also reduces the chance that a large storm event would trigger some type of large scale erosion from existing roads. Therefore short-term impacts would be identical to those described for the proposed action but the long-term impacts may reflect some further decrease in sediment yield to Lacks Creek and Redwood Creek due to the decreased risk of erosion.

Impacts from Wildlife Management

The nature of the proposed activities is very similar to the proposed action. Thus, as with the proposed action, no impacts are expected.

Impacts From Vegetation Management

Prairie Restoration

Alternative 2 would increase the prairie footprint and would require the removal of some large trees of commercial value and may also require the use of heavy equipment. Thus, the activities described in Alternative 2 contain a combination of those activities described for the Vegetation (Prairies) section of the Proposed Action and those described for Commercial Thinning in the Forest Management portion of the Proposed Action. Potential impacts from these activities include temporary increase in sediment yield, and in water turbidity, and the possible introduction of toxics such as fuel or lubricants into watercourses.

Sediment and Turbidity

Removing fallen trees using heavy equipment is a ground disturbing activity. Heavy equipment tracks can disturb native soils. Dragging fallen trees to a road or landing can also disturb native soils. Loosened soil can be transported to stream channels and riparian areas during subsequent rainfall. The probability that sediment would enter a stream channel or riparian area depends on the amount of exposed soil, the proximity to a stream channel, the slope, intensity of rainfall, and the amount of vegetation buffer between the exposed soil and the stream channel. The prairies in the management area are generally a great distance from the mainstem of Lacks Creek (see Map 3-1 for prairie locations) and do not contain stream channels. Thus, the probability that any sediment would reach a stream channel is negligible.

Toxics

Use of heavy equipment for road disking and use of chainsaws and gas-powered chippers for conifer removal require the use of fuels and lubricants. Leaks or spills of fuels or lubricants occurring near stream channels or riparian habitat could result in impacts to fish or riparian dependent species. The prairies in the management area are generally a great distance from the mainstem of Lacks Creek (see Map 3-1) and do not contain stream channels. Thus the probability of toxic materials reaching a stream channel or riparian area is so low as to be negligible.

Forest Management

The management actions for Alternative 2 are essentially identical to the Proposed Action with some expansion of treatment acreage. Therefore, the impacts are the same as those described for the Proposed Action.

Special Forest Products: Same as Proposed Action.

Impacts from Cultural Resource Management: Same as Proposed Action

Impacts from Recreation and Transportation Management

Alternative 2 would increase the road upgrading on the Midslope Road and Lacks Creek Road. Impacts from this are identical to those described for the Proposed Action. Additional mountain bike trails would also be constructed in this alternative. These trails would be constructed using the SOPs in Appendix A-4, and impacts would be similar to the proposed action.

Impacts from Fire Management: Same as proposed action.

4.6.3 Impacts under Alternative 3 (No Action Alternative)

Impacts from Fisheries, Riparian, and Water Quality Management

Management actions under this alternative include protection of riparian resources and watershed restoration. Watershed restoration activities are not specified in this alternative but would likely include the same types of activities (road upgrading and decommissioning) found in the Proposed Action. However, these activities would likely be implemented at reduced levels, as the comprehensive restoration planning under Alternatives 1 and 2 would be used to justify

projects/funding. Thus, under this alternative chances would be increased regarding a large storm event triggering some type of large scale erosion from existing roads. Long-term impacts could be greater than those described for the Proposed Action regarding increased sediment yield to Lacks Creek and Redwood Creek due to the increased risk of erosion.

Impacts from Wildlife Management

Management actions under this alternative includes supporting recovery actions and protecting marbled murrelet habitat neither of which alter landscape components or processes which affect fish habitat, riparian resources, or water quality. Thus, no impacts are expected.

Impacts from Vegetation Management

A. Prairie Restoration

Management actions under this alternative include preventing unauthorized livestock grazing and gathering baseline data. Neither of these activities would alter landscape components or processes which affect fish habitat, riparian resources, or water quality. Thus, no impacts are expected.

B. Forest Management

Management actions under this alternative are similar to the proposed action, although at a greatly reduced scale (200 acres of treatments proposed vs. 1,369 acres in the proposed action). Therefore, the types of impacts of this alternative would be the same as the proposed action, but they would occur at a reduced scale.

Impacts from Cultural Resource Management: Same as Proposed Action

Impacts from Recreation and Transportation Management

Management actions under this alternative include road maintenance, minor trail improvement, and development of parking areas. These activities are proposed for areas which are well away from stream channels and riparian areas and thus no impacts are expected (see Map 3-2).

Impacts From Fire Management: Same as proposed action.

4.6.4 Cumulative Impacts related to Fisheries Riparian and Water Quality Management

Assessment Area: The assessment area for discussion of cumulative impacts to fisheries, water quality, and riparian resources is the Lacks Creek and Redwood Creek watersheds. Lacks Creek is a major tributary to Redwood Creek.

Past, Present and Reasonably Foreseeable Future Actions/Cumulative Impacts: Past impacts to fisheries, water quality, and riparian resources in the Lacks Creek and Redwood Creek watershed have been due, to a large degree, to an overabundance of sediment which has been moving through stream channel networks. The basin is naturally erosive but widespread logging activities peaking in the middle of the 20th century together with large flood events resulted in increased sediment in the stream channels throughout most of the Redwood Creek watershed. Increased sediment loads tend to alter channel morphology and can decrease the

abundance and quality of habitat for Pacific salmon species as well as other aquatic and riparian-dependent species.

Since the mid-20th century, logging has continued in the Redwood Creek and Lacks Creek watersheds. Logging, road building, and road maintenance practices have changed over the past several decades so that current practices pose much less risk of future erosion compared to mid-20th century logging. The legacy of erosion risk from past logging remains, however. Since the 1980s, Redwood National and State Parks has decommissioned approximately 230 miles of abandoned logging roads in the lower Redwood Creek watershed. Since the mid-1990s decommissioning of abandoned logging roads has occurred on private lands in the mid and upper portions of Redwood Creek at the rate of about two to three miles per year.

In the foreseeable future, road decommissioning and road upgrading will be occurring in Redwood National and State Parks as well as on private lands in the mid- and upper-Redwood Creek watershed. Approximately 110 miles of road decommissioning is planned for Redwood National and State Parks lands. It is reasonable to assume that two to three miles of road per year of road will be decommissioned on private lands in the basin in the foreseeable future. These activities should remove some of the risk of erosion associated with the legacy of abandoned logging roads.

The proposed action, considered in context with the past, present, and reasonably foreseeable future actions occurring within the watershed, would add to the trend of a reduction in erosion risk. In turn, this could allow for an improvement of habitat for Pacific salmon and other riparian dependent species over the coming decades.

4.7 Wildlife Management

4.7.1 Assumptions and Incomplete Information.

- The SOPs contained in Appendix A (A-2 Wildlife Management) would be implemented under all alternatives. No primary constituent elements of northern spotted owl or marbled murrelet habitat would be removed or degraded.
- Actions taking place in the assessment area but outside the BLM management area will continue at levels similar to present actions (timber harvest levels etc.).
- Population levels are unknown or incomplete for most wildlife species.

4.7.2 Impacts under Alternative 1 (Proposed Action)

Impacts from Wildlife Management

Northern Spotted owl – Under Alternative 1, the management area may support up to four occupied territories within 20 years. The recovery of the spotted owl is being negatively impacted by the range expansion of the barred owl. Barred owls have been detected in the Lacks Creek Management Area at locations that have been historically occupied by spotted owls. The presence and success of barred owls in the management area may become the future, primary, limiting factor in the increase of occupied spotted owl territories in Lacks Creek. The reasons

for this expansion are not fully known, however, the BLM has no authority to manage or control barred owl populations, so this impact is outside the scope of the plan. Currently there is approximately 1,254 acres of late-mature and old-growth forest suitable for spotted owl nesting and roosting. As forest treatments are initiated, the amount of suitable habitat will increase over time.

Marbled murrelet – Under Alternative 1, it is unpredictable how many nesting murrelet pairs the management area could support within 20 years. Opportunistic murrelet surveys conducted in 2007, within the best habitat found in the management area, did not detect any birds. The habitat found in Redwood National and State Parks, downstream of Lacks Creek, provides higher quality, more abundant and easily accessed nesting habitat for the murrelet. Therefore, any current or future marbled murrelet nesting habitat in Lacks Creek may not be utilized. Currently there are approximately 1,254 acres of late mature and old growth forest suitable for marbled murrelet nesting. As forest treatments are initiated the amount of suitable habitat will increase over time.

Pacific Fisher –Under Alternative 1, the management area may support up to five territories within 20 years. Currently there are approximately 2,300 acres of mid mature to old growth forest suitable for fisher occupancy. As forest treatments are initiated the amount of suitable habitat will increase.

BLM sensitive species, uncommon species or land features requiring protective measures – Additional BLM sensitive species, uncommon wildlife species or unusual land features desirable to wildlife may be discovered in the course of surveys or inventories. These sensitive or uncommon species and land features may require protective measures. Examples include; any nesting raptors (eagles, hawks, falcons, owls) would require a restrictive buffer around the nest location, any concentrated bat roosts would require a restrictive buffer surrounding the roost location, and some nesting concentrations of uncommon migratory birds may require protective measures.

Elk and deer –Under Alternatives 1 and 2, the elk and deer populations in the management area are expected to increase within 20 years due to vegetative treatments in the forest and prairies. Under Alternative 3, the elk and deer populations may remain the same or decrease due to the lack of treatment to remove encroaching vegetation in the prairies and oak woodlands. Current population size of deer and elk using the management area are not known. Monitoring for deer and elk would be required to determine current use and to estimate future increases in population.

Wildlife management activities: Most of these impacts will be short-term. For example, localized displacement of wildlife as biologists drive through the area and trampling of vegetation as they walk off trail through the forest. In the process of surveying for spotted owls there is a moderate possibility of creating a negative interaction between spotted and barred owls. There will be an increase in knowledge and understanding gained from the additional surveys and inventories.

Impacts from Fisheries, Riparian and Water Quality Management

The excavation work, vegetation removal and noise generated from the road decommissioning activity will cause, at a minimum, a short-term, localized displacement for all wildlife. The excavation work will be fatal for some small wildlife and create a localized but permanent displacement of others that have burrows and dens along the excavation route. The vegetation

removed to open the road system will cause a localized, seasonal or permanent displacement for the wildlife that depends on that vegetation. The road stabilization and decommissioning work will have a moderate but short-term, localized impact on wildlife.

Impacts from Vegetation management

Prairies

The human activity and noise generated from vegetation management will cause a short-term, localized displacement of wildlife during those operations. The vegetative mechanical treatment in the prairies will initially reduce the number of young fir trees around their perimeters having minimal impact on wildlife. The resulting increase in size of the prairies will benefit species such as elk, which utilize prairie habitat.

Forest Management

The human activity and noise generated from forest management will cause a short-term, localized displacement of wildlife during those operations. The trees and vegetation removed for these operations will cause a localized but permanent displacement of the wildlife that utilize the individual trees or the habitat component that the vegetation provided. The proposed forest treatments will be completed outside the reproductive season of most wildlife, minimizing the impact to nesting or denning wildlife. The resulting change in habitat, both short and long-term, may attract a different set of wildlife species adapted to this altered vegetative condition. The expected long-term results of forest treatments proposed in the management area will be beneficial to wildlife by attracting target species adapted to late successional forest habitat.

Impacts from Recreation and Transportation Management

Trails– New trail construction will cause a localized but permanent displacement of wildlife that occupy the area on or near the trail. Human use of the trails, both new trails and existing roads converted to trails, will alter the behavior of most wildlife near the trails. Minimal human use of the trails will cause temporary, localized displacement of some wildlife. Maximum human use of the trails will cause localized but permanent displacement of some wildlife. Some wildlife will use these trails to increase mobility. This wildlife use may increase interactions with humans or increase the opportunity for predators to target prey. The impacts to wildlife from increased presence and mobility of humans on designated trails in the management area will depend largely on the quantity of human use. The impacts are expected to range from minor to moderate.

Campgrounds and parking facilities – New construction for these facilities will permanently displace the wildlife that occupy or use the area to be cleared. Human activity associated with these facilities, at moderate or greater use, will permanently displace most wildlife in the immediate area. Wildlife that scavenges human food will be attracted to these areas and may suffer from the ingestion of the human food or from the interaction with humans. The impacts to wildlife from the increased presence of humans in designated campgrounds or parking areas in the management area will depend largely on the quantity of human use. The impacts are expected to range from minor to moderate.

There may be an increase in hunting activity within the management area. An increase in hunting would cause additional disturbance to most wildlife from increased traffic and human activity. The California Department of Fish and Game regulates the determination of hunting areas and sells hunting permits and licenses.

Impacts from Fire Management

The human activity associated with prescribed burns will cause a short-term, localized displacement of most wildlife. The resulting fire will cause a short-term, localized displacement of most wildlife and be fatal to some small wildlife that cannot escape the flames. The long-term benefits of this periodic fire treatment will outweigh any short-term negative effects.

4.7.3 Impacts under Alternative 2

Impacts from Wildlife Management: Same as alternative 1

Impacts from Implementing Other Programs

Same as Alternative 1 except: Wildlife disturbance and displacement will increase with this alternative due, primarily, to the increase in recreation development. These negative impacts expected with the additional trails and campsites would occur on both the east and west sides of the drainage. If the recreational opportunities attract a high level of use wildlife disturbance would be high. However, if impacts approach moderate to high levels, facilities would be relocated or removed. This alternative would increase benefits to those wildlife species that utilize prairie habitat due to the planned increase in prairie restoration. Also, additional forest treatments would accelerate the development of more late successional habitat.

4.7.4 Impacts under Alternative 3 (no action)

Impacts from Wildlife Management

Similar types of impacts would occur as those outlined in Alternative 1. However, survey and monitoring would be implemented at a much lower intensity, since fewer projects would be implemented under this alternative.

Impacts from Implementing Other Programs

Under this alternative late successional forest growth would be delayed from lack of forest treatments. This delay would be detrimental to those species targeted for priority management under the Arcata RMP (Spotted Owl, Marbled Murrelet and other late successional habitat species) and would be beneficial to those species that are adapted to the current condition. The prairies and oak woodlands would eventually be overgrown with trees and those wildlife species that prefer or are adapted to that habitat (e. g. elk) may be completely displaced from the management area. Under Alternative 3 the treatments that accelerate the growth of suitable habitat would not take place and therefore, it is expected, the population of spotted owls would increase at a slower rate or not at all. Less disturbance and displacement to wildlife would be caused by recreational use or vegetative and forest treatments.

4.7.5 Cumulative Impacts to wildlife

Assessment Area: The area considered for assessment of cumulative impacts on wildlife is four miles beyond the BLM property boundaries of the Lacks Creek Management Area. This distance reasonably covers the distance that most wide ranging and dispersing wildlife or resident birds will travel to move in or out of the area. The marbled murrelet, which is a seabird flying from the coast, and migratory birds using the area seasonally are the exceptions to this assessment area. These birds will be considered separately for impacts.

Past, Present and Reasonably Foreseeable Future Actions and Cumulative Impacts:

Actions within the assessment area are primarily commercial timber production taking place on most forested areas outside and within (past only) the management area and livestock grazing on private land to the north and west of the management area. There also is residential development scattered throughout the assessment area, a small concentration of houses in the Redwood Creek Valley, recreational activities on public lands, and traditional uses by Native Americans on the Hoopa Indian Reservation. The cumulative impacts to wildlife habitat under all alternatives would offset impacts on surrounding private lands. The newly acquired BLM lands will be taken out of commercial production and allowed to mature to benefit those species that are adapted to a mature forest. It is assumed that the reasonably foreseeable future actions outside of the BLM boundary will be sustainable and consistent with past actions (continued harvesting and retention of earlier successional habitat characteristics). Marbled murrelets that may use the management area for nesting are also dependent upon adequate foraging and water quality conditions in the ocean. The migratory birds that may use the management area seasonally are dependent upon conditions present in the areas in which they overwinter.

4.8 Vegetation Management (excluding Forest Management which follows in 4.9)

4.8.1 Impacts under Alternative 1 (Proposed Action)

Impacts from Vegetation Management.

Prairies

The following actions would be completed for prairie restoration under this alternative (typically one project per year):

- Faulkner Prairie: 40 acres broadcast burning + 10 acres mechanical treatment (lop and scatter slash)
- Preston and Round Prairies: 30 acres broadcast burning
- Pine Ridge Prairie: 50 acres of broadcast burning + 20 acres of mechanical treatment (lop and scatter slash)
- Sidehill and Last Prairies: 20 acres broadcast burning + 10 acres mechanical treatment (lop and scatter slash)
- Beaver Ridge, Flyette, and Kit Prairies: 40 acres of broadcast burning + 20 acres mechanical treatment (lop and scatter slash)

Grazing could also be applied on a project level basis. This would include short season of directed, project level use from mid-April through mid-May or mid-May to mid-June; depending upon snow pack and logistical capabilities of livestock operator. Late spring/early summer grazing would allow the upland native perennial grasses to flower and seed, while still benefiting the prairies through thatch and young brush reduction, and nutrient cycling that comes with grazing. Up to approximately 70 head of cattle would be released for a short time to graze in the prairie until desired conditions are met, and then driven out into Hundred Acre Prairie which is located on private lands adjoining the management area. Project level grazing would need to occur in between a fire cycle, to allow vegetation to recover after a fire. Several years after the fire would be considered a good time to apply grazing as a tool to maintain conditions achieved with fire.

Long-term, direct benefits to prairie restoration could result from broadcast burning and mechanical removal of invasive conifer species through reduced competition for light, water, and soil nutrients that slowly but steadily displace native perennial grass communities. A short-term, direct benefit that would result from broadcast burning of prairies is the flush of growth that comes in response to additional accessible nutrients mobilized by fire. Prairies would also benefit from any project level grazing, if applied at an appropriate time, such as between a fire cycle when decadent material has had a chance to accumulate. Grazing can reduce thatch accumulation, stimulate new grass growth, and help distribute and cycle nutrients such as nitrogen that encourage plant growth.

Within Flyette, Preston, and/or Faulkner Prairies, traversing roads would be disked/ripped and resculpted to facilitate natural reseeding and reclamation, or may be converted to trail routes. In either case, the long-term, direct effect is expected to be beneficial and that there will be a slight, net increase to grasslands.

The prairies may become more susceptible to invasive, non-native plant species as a result of program implementation. This is expected to be a localized, short-term effect that would be neutralized by rapid plant community response, and vigilant invasive species inspection and eradication efforts.

An increase in palatability of the prairies to livestock may occur following the fire that could create an attractive nuisance to unauthorized livestock from neighboring private lands. The impact is likely to be negligible as unauthorized livestock use is resolved upon detection by policy as soon as possible.

Bureau Sensitive Species

Maintenance of late successional and old-growth habitat is a primary objective of the Lacks Creek Management Plan. There are no projects planned regarding Bureau Sensitive Species. Late successional forest reserve management protects trees beyond 90 years old; no trees would be cut beyond (20 inch dbh) within the plan alternatives. Thinning of early mature forest types described in the Forest Management section of the plan will accelerate mid-late mature forest characteristics which will enhance Bureau Sensitive Species available habitat.

Invasive, non-native weeds

Invasive weeds would be manually eradicated annually through visual inspection and manual removal of any weeds encountered (i.e. French broom) in prairies, on existing roads, and in any new areas of disturbance. This would minimize any threat of major infestation of weeds.

Impacts from Implementation of Other Programs on: Prairies

An indirect, long-term benefit of a recreational trail route traversing the grasslands is that it would provide an opportunity for the public to access the grasslands. The public would have an opportunity to learn about the prairie ecosystems and develop a sense of appreciation and stewardship. Furthermore, hunting use of the prairies would create a demand by those users to maintain the prairies for upland game habitat and their future hunting enjoyment.

Invasive, non-native weeds

The proposed action contains standard weed prevention measures to be followed by all other programs, so there should be no additional impacts to the level of invasive weed presence or rate of introductions. However, should road disturbance, watershed repair, thinning activity, or other actions result in a new weed infestation, it would be abated and or eradicated through the annual inspection and eradication efforts that are part of the invasive weed proposed action.

Bureau Sensitive Species

Known populations of Pacific fuzzwort (*Ptilidium californicum*) and *Lobaria oregana* are within monitored permanent plots within the Lacks Creek watershed. Under any alternative and for any program area, there would be no cutting of late successional or old-growth trees within the assessment area and therefore there would be no impacts to either non-vascular bureau sensitive plant species.

4.8.2 Impacts under Alternative 2

Impacts from Vegetation Management Prairies

This alternative increases acreage for burning by 30 percent and increases mechanical treatments by 200-percent and could involve the commercial sale of timber (under 20 inch dbh) encroaching on areas that were historically prairies. The following projects would be implemented, generally one per year:

- Faulkner Prairie: 52 acres broadcast burning plus 20 acres mechanical treatment (lop and scatter slash)
- Preston and Round Prairies: 39 acres broadcast burning
- Pine Ridge Prairie: 65 acres of broadcast burning + 40 acres of mechanical treatment (lop and scatter slash)
- Sidehill and Last Prairies: 26 acres broadcast burning + 20 acres mechanical treatment (lop and scatter slash)
- Beaver Ridge, Flyette, and Kit Prairies: 52 acres of broadcast burning + 40 acres mechanical treatment (lop and scatter slash)

This alternative would increase the size of restored prairies by 114 acres over Alternative 1 (354 acres vs. 240 acres total prairie restored/maintained)

Proposed use of grazing as a tool would be the same as Alternative 1

Invasive, non-native weeds – Same as Alternative 1

Bureau Sensitive Species - Same as Alternative 1

Impacts from Implementing Other Programs on:

Prairies – Same as Alternative 1

Invasive, non-native weeds -- Same as Alternative 1

Bureau Sensitive Species- Same as Alternative 1

4.8.3 Impacts under Alternative 3 (No Action)

Impacts from Vegetation Management

Prairies - Under this alternative no prescribed burning, mechanical treatments, or project level grazing would be authorized for coastal prairie restoration or maintenance.

Moderate to large reductions in the acreage of prairie community would continue. The rate of prairie habitat loss would increase as the proportion of edge effect would continue to increase relative to the proportion of open grassland. The existing prairies are relatively small in size, so could eventually be replaced by forest unless a wildfire or other natural disturbance maintains them.

Invasive, non-native weeds – Same as Alternative 1

Bureau Sensitive Species – Same as Alternative 1

Impacts from Implementing Other Programs on:

Prairies - Under the no action alternative, other programs would have no effect on the prairie condition as is reflected by current management.

Invasive, non-native weeds – Same as Alternative 1

Bureau Sensitive Species – Same as Alternative 1

4.8.4 Cumulative Impacts related to Vegetation Management

Assessment Area: Redwood Creek Watershed

Past, Present and Reasonably Foreseeable Actions and Cumulative Affects:

Prairies

Regionally, current maintenance and restoration of prairies occurs where active grazing is maintained and or prescribed burns applied. Many prairies in the region exist among heavily wood areas. Historically, Native Americans burned these areas to help preserve the open environment to make food collection easier and enhance the habitat for the game on which they depended, such as elk and deer. Fire suppression and gradual changes in land use over the last 150 years has allowed Douglas-fir to invade the prairies; particularly below the fog line.

To the west and adjacent to the project area are vast tracts of private grassland (Barnum lands) leased for grazing. Several thousand acres are grazed seasonally and annually by cattle. To the north of the project area is the Stover Ranch, roughly 7,000 acres in size, containing a continuous prairie comprising about 1/3 of the ranch (several thousand acres) that is grazed by cattle, deer, and elk. Beyond the Stover Ranch, approximately six miles to the northwest of the Lacks Creek project area, is the Bald Hills prairie managed by Redwood National and State Parks. Park personnel annually conduct controlled burns on about 4,300 acres of Bald Hills prairie and oak woodland in an effort to replicate the burning done by Native Americans before 1850.

In total, there are 594 total acres of prairie in the 8,673 acre Lacks Creek management area that are proposed to be maintained through an integrated means including mechanical, grazing, and prescribed fire under alternatives 1 and 2 respectively. Cumulatively, these acres contribute in a very small way to the overall conservation of prairies in the region, but none-the-less, help provide a corridor of available habitat for plants and animals that depend on them. The no action alternative would ultimately contribute to the local and regional loss in grasslands, but more precisely, examples of native bunchgrass prairies. The Lacks Creek prairies are predominately covered in native perennial bunchgrass species, and not naturalized annual grass species that dominate many grasslands in the region. The Lacks Creek prairies are a refuge for native grass biodiversity and provide a view into what vast tracts of prairies in California may have looked like in the past. Native perennial bunchgrass prairies also provide forage to wildlife and upland game later in the summer and fall; whereas annual grasslands peak in the late spring and early summer.

Bureau Sensitive Species

The Lacks Creek proposed action conserves 1,320 acres of late successional Douglas-fir-tanoak forest and 1,157 acres of mid-mature Douglas-fir forest that will transition to late-mature in several decades. These forests provide prime available habitat for non-vascular Bureau sensitive species including fungi, bryophytes and lichens. Public lands that conserve late forests are cumulatively important for sustaining biodiversity of rare species. Additional late successional low elevation Douglas-fir forest is limited in the Redwood Creek watershed due to management for commercial timber harvesting. Restoration of Lacks Creek forests will partially offset this impact.

Invasive weeds

The Lacks Creek area is largely free of invasive, non-native species. French broom (*Genista monspessulana*) is currently being controlled along roadways to eliminate any potential spread. Regionally, it is known that in the Bald Hills prairies management area administered by Redwood National and State Parks there is an infestation of Harding grass (*Phalaris aquatica*). As a result, BLM staff members are aware and alert for any new infestations to Lacks Creek project area prairies. At the base of the Bair Road, a county road that turns away from Redwood Creek heading east toward the project area, there is a half mile long roadside infestation of French Broom. The County has been notified and is now aware of the infestation. Increased presence of agency employees to the management area may help discover any new untreated infestations of invasive non-native species and may also raise awareness among other landowners and community members; potentially creating an effort to control the weeds and help prevent further spread.

4.9 Forest Management

4.9.1 Impacts under Alternative 1 (Proposed Action)

Impacts from Forest Management

Implementing the treatments proposed with this alternative would result in a major positive impact on the forest resource. Increasing the amount of active management such as thinning and converting the hardwood stands would hasten the return of late successional attributes to forest stands and have a major positive long-term impact on the forest in the Lacks Creek watershed and implement a primary goal of the Arcata RMP. The hardwood restoration treatments will have a major positive impact on the oak woodlands for both the short-term and long-term. Additional special forest products (primarily cordwood; up to 300 cords per year) would be made available as a byproduct of forest management activities. A small number of sawlogs would also be produced through commercial thinning projects.

Impacts from Cultural Resources Management

Under this alternative, existing policies would remain in place to protect cultural resources, and could result in minor impacts on forest management activities. All silvicultural projects would be surveyed for cultural resources and if any are discovered the treatment area or project must be designed to protect the cultural resources. This could have a minor negative short-term impact on forest restoration activities and management activities would be restricted, delayed or modified to protect the cultural resources.

Impacts from Fisheries, Riparian and Water Quality Management

The decommissioning of old logging roads and converting approximately six miles of decommissioned road to trails using heavy mechanical equipment would have no impact on forest resources for the life of the plan since silvicultural treatments have been coordinated and planned to coincide with the decommissioning of the old logging roads.

Impacts from Wildlife Management

Impacts to forest resource management projects would depend on results of spotted owl, marble murrelet, and fisher surveys. Should wildlife surveys indicate suitable habitat is occupied by any of the above mentioned species, then restrictions related to human activities within 500 feet of nesting locations result in short-term moderate impacts on projects by delaying the implementation of the treatments during limited operational periods.

Impacts from Vegetation Management

Impacts to forest resources and forest projects would depend on results of plant and cryptogammic species surveys. Should surveys locate endangered and/or threatened species, then restrictions related to protecting the plant species would have a minor impact on forest management activities, as most projects can be revised to protect plants without large effects on overall project goals. Existing programs to eradicate invasive plant species would have negligible impact on forest management activities. Restoration of coastal prairies would slightly reduce the acreage of Douglas-fir coverage within the management area. However, this is considered to be a minor forest impact as the prairies are part of the historical landscape.

Impacts from Fire Management

Wildfires would have a short-term and long-term negative and/ or positive impact on forest resources based on the severity of the wildfire.

A light fire would have a positive short-term impact on forest resources since it would reduce the fuel loading and prevent a future catastrophic stand replacement fire. On the other hand a severe fire such as a stand replacement fire would have negative long-term impacts since the forest stand is lost and will take many years to re-grow. Under alternative 1, the forest treatments would reduce fuel loading in second growth stands reducing the chance of a stand replacing fire.

Prescribed fire proposed for forest and prairie treatments would have a positive impact on forest resources since it would reduce the chances of a stand replacement fire and help in the development of late successional attributes and characteristics of a more mature stand.

Impacts from Visual Resource Management

Impacts from management of visual resources could have a minor short-term impact on forest restoration as some treatments might be limited in some areas in so far as certain forest treatments are not visually pleasing in the short-term. However, the VRM objectives under the preferred alternative allow for silvicultural treatments.

4.9.2 Impacts under Alternative 2

Impacts from Vegetation Management

More intensive meadow/ grassland restoration as described in the Vegetation Alternative 2 prairie section would result in additional acreage being converted from Douglas-fir forest to prairie. Although this would include the removal of some larger trees, it is still considered to be a minor impact to forest management, as the prairies would only be enlarged to a size that was present historically on the landscape.

Impacts from Implementing other programs: Same as alternative 1

4.9.3 –Impacts under Alternative 3 (No Action)

Impacts from Forest Management

The no action alternative would result in minor impacts to forest resources. Because only a small amount of thinning and hardwood conversion would be completed, the long-term objective of accelerating the development of late successional forests would most likely not be met. The development of late successional forest characteristics and wildlife habitat for old-growth dependent species would take longer, and may be set back due to a higher threat of wildfire on dense forest stands.

Impacts from Fire Management

Since minimal forest management & fuels reduction would occur, there is an increased potential for wildfire impacting larger acreages under this alternative. Fires in the early-mid successional Douglas-fir forests are often stand replacing events, and would set back the development of late successional forest stands.

Impacts from all other programs: Same as Alternative 1

4.9.4 Cumulative Impacts from Forest Management

Assessment Area: Redwood Creek watershed

Past, Present and Reasonably Foreseeable Future Actions and Cumulative Impacts: Over the long-term, the forest restoration activities proposed under Alternatives 1 and 2 would serve to partially offset impacts from continued timber harvesting on commercial forest lands in other portions of the watershed. Forest management activities as proposed under Alternatives 1 and 2 would accelerate the development of late successional forest characteristics. Commercial forest stands on private lands are expected to continue to be managed at early-mid successional stages.

Oak woodland restoration projects would assure that this type of vegetation community continues to be part of the vegetation mosaic in the Redwood Creek watershed. Oak woodland maintenance is also being practiced in Redwood National and State Parks. In other portions of the watershed, oaks are being removed where they compete with commercial timber resources.

4.10 Recreation and Transportation Management

4.10.1 Assumptions and Incomplete Information

Current and projected visitor use levels are based on professional estimates of field personnel. This includes extrapolations from observations of visitor use levels in areas in the region with similar levels of access and developments to those proposed under the alternatives.

4.10.2 Impacts under Alternative 1 (Proposed Action)

Impacts from Recreation and Transportation Management

Standard operating procedures (Appendix A-4) and objectives/actions in this alternative regarding visitor information and interpretive material dissemination, road and trail maintenance, law enforcement, barrier installation, universally accessible standards, and stressing compliance with “leave no trace” principles would have a long-term, moderate, and beneficial impact on recreation, transportation, and public safety . Providing improved visitor information by developing a new brochure, maps, and interpretive materials would result in a long-term, moderate beneficial impact on recreation because visitors would know how to prepare for and access the area, practice low impact use techniques, and fewer visitors would become lost in the backcountry. Adequate and timely maintenance of roads, facilities, trails, and signs would also have a long-term, moderate, and beneficial impact on recreation by providing opportunities for visitors to easily obtain directional information, providing easier access to backcountry areas, providing new areas to explore, and avoiding access constraints which could detract from the visitor experience. Installing signs would have long-term, moderate, beneficial impacts on recreation because visitors would be less likely to trespass onto private property, less likely to become lost, and more likely to recreate in a safe and orderly manner. Unless properly designed to blend into the surrounding landscape, additional signage could also detract from a natural primitive experience in backcountry areas. Providing supplementary rules and regulations such as allowing overnight camping and campfires at designated sites only, eliminating the use of campfires during extreme fire conditions, and allowing bicycle and equestrian uses on designated roads and trails only would protect resources, visitor safety, and the surrounding community. They would have minor impacts on recreation because visitor behavior or equipment usage would only have to change slightly to comply with the new rules.

Increased enforcement of regulations would reduce visitor safety incidents, conflicts with other users, and would ensure additional protection of sensitive resource areas. These benefits would allow visitors to have an improved recreational experience. Use levels for non-motorized recreationists are expected to increase to 4,000 visits annually, resulting in long-term, moderate, beneficial impacts because more people would have the opportunity experience their preferred type of recreation. Use levels for motorized recreationists are expected to increase from the present 250 visitor days by five percent annually for five years and then level off, resulting in a long-term, minor, beneficial impact as a few additional people would have the opportunity to experience their preferred type of recreation. This level of use is well below capacity levels for the area based on the visitor experiences called for under the plan.

Ensuring that universal accessibility standards are met would have a long-term, moderate, beneficial impact on recreation. Visitors percent with disabilities would have an improved recreational experience because of improved access to developed sites. Proposed facility developments such as trailhead parking and camping areas would have a long-term, moderate, beneficial impact on visitors because of the safety and convenience these facilities provide. Construction and maintenance of fences and vehicle barriers would have long-term, minor impacts on recreation due to the visual effect on primitive areas in the backcountry. Construction of new trails and converting old logging roads to trails would result in long-term

beneficial impacts for recreation visitors due to increased opportunities for a variety of recreation user groups to more easily explore new backcountry areas (hunters, hikers, equestrians and mountain bikers). The area would provide these opportunities in close proximity to the Humboldt Bay population centers, reducing the driving time for residents to access opportunities. This is expected to be especially beneficial to mountain bike users, as their riding opportunities in the region are extremely limited. Mountain bikers would be provided with greater opportunities to develop their skills and abilities while riding on challenging terrain.

Impacts from Cultural Resource Management

Providing visitors with interpretive materials such as signs, brochures, and web-based presentations regarding prehistoric and historic cultural resources would have a long-term, minor, beneficial impact because their expressed desire to learn more and appreciate the importance of these resources would be more fulfilled. Recording cultural properties and developing a cultural resource management plan would have no impact on recreation.

Impacts from Fisheries, Riparian and Water Quality Management

Converting approximately six miles of decommissioned road to trails using heavy mechanical equipment would have long-term, moderate, beneficial impacts on recreation by providing increased opportunities to explore new areas and easier access into the backcountry in a more natural setting (trail vs. road). There would be short-term, minor, localized impacts on recreation when the equipment is being operated due to increased noise, dust, and motor emissions. Some visitors would be inconvenienced with short-term route closures. Roads proposed for decommissioning that are not part of the proposed trail network would have no impact on recreation.

Impacts from Wildlife Management

Impacts to trail and facility construction and/or maintenance projects would depend on results of spotted owl, marbled murrelet, and fisher surveys. If surveys indicate suitable habitat is occupied by any one of these wildlife species, then restrictions related to noise and other human activities within close proximity to a nest or den location could take effect, resulting in a short-term, moderate, localized impact on those visitors planning on traveling through or camping in that particular area. Because there may be limited operational periods and equipment use for trail maintenance, some trails damaged by winter storms may not be accessible until later in the season, resulting in a short-term, minor impact on visitor opportunities to access the backcountry. Research and monitoring activities would have no impact on recreation.

Impacts from Vegetation Management

Allowing cattle to graze in the meadows during the spring or early summer would have a localized, short-term, minor impact on recreation if cattle were to block visitors from traveling on the trail, if visitors had to travel over cattle excrement, or if an aggressive cow made it unsafe for people to be nearby. Performing broadcast burns in the prairies would have a localized, short-term, minor impact on recreation due to temporary closures in the immediate vicinity of the burning area. Prescribed and/or pile burning would be conducted during late fall through early spring; the period of lowest visitor use during the year. Burning the meadows would have a localized, long-term, minor benefit to hunters because the meadows would remain intact or be expanded. Removing invasive weeds is not expected to have an impact on recreation.

Impacts from Forest Management

Pre-commercial thinning, commercial thinning, hardwood conversion, and oak woodland restoration projects would have localized, short-term, minor impacts on recreation as a result of noise generated from the use of chainsaws and other mechanical equipment, and temporary closures while trees are being felled adjacent to roads and trails. Prescribed and/or pile burning in the oak woodlands would have a localized, short-term, minor impact on recreation because the area to be burned would be temporarily closed to public use. Hunters would benefit from thinning and burning because animals would be easier to see and higher numbers of deer generally frequent the oak woodlands than other habitat areas. Providing special forest products such as fuel wood, mushrooms, beargrass, etc. would have no impact on recreation.

Impacts from Fire Management

Wildfires would have a short-term, moderate impact on recreation because the entire management area would most likely be temporarily closed to all public use until the fire is controlled.

4.10.3 Impacts Under Alternative 2

Impacts from Recreation and Transportation Management

Impacts would be the same as the Proposed Action except there would be long-term, minor impacts on 4WD vehicle users because the Midslope Road would be converted into a trail that would be too narrow for full-sized vehicles. Although this route receives limited use, a small number of visitors would not have the opportunity to experience their preferred type of recreation. There would be long-term, minor beneficial impacts on non-motorized recreation users from constructing three miles of additional trail that would connect the end of the Pine Ridge Spur Roads to Pine Ridge Road. Up to 10 additional miles of mountain bike trails would be constructed, creating long-term, moderate beneficial impacts on bike riders because more people would have more miles of trail to travel upon and greater opportunities to experience their preferred type of recreation. Providing up to 10 additional backcountry campsites would have long-term, minor, beneficial impacts because there would be greater opportunities for visitors to select overnight camping locations. Projected non motorized use levels would increase to 4,500 visitor days. Motorized use would increase approximately 4 percent per year.

Impacts from Other Management Programs: Same as Alternative 1

4.10.4 Impacts Under Alternative 3 (No Action)

Impacts from Recreation and Transportation Management

Most of the positive impacts identified under the Alternative 1 would not occur, because there would be a minimal amount of trails and facilities developed. Mountain bikers would be impacted the most because trails specifically designed for their use would not be constructed. Visitors would be provided with a connector trail to access to the network of roads on the west side of Lacks Creek, but those access routes not required for administrative use would not be maintained. Over time, they would eventually become impassable, making it more difficult for visitors to travel into the backcountry and explore new areas – effectively making the west side

of the area inaccessible to most visitors. The 7.5 miles of abandoned logging roads to be converted to trails using hand labor (identified under Alternative 1) would not occur, resulting in a lack of loop trails and an increase in dead-end trails. This would result in long-term, moderate impacts on trail users because they prefer to travel and explore new areas instead of backtracking on the same trail(s). Conflicts regarding congestion and possible safety on the more heavily used trails would be greater under this alternative because the number and amount of miles of trail available for use would be reduced. These conflicts would be reduced slightly because, unlike Alternative 1, cross-country travel would be allowed. Trailhead facilities, other than the one proposed at the end of Lacks Creek Road, would not be developed, which could result in vehicles being parked in locations such as along the road or small turnouts that could cause congestion, disorientation, and confusion. Visitors would be able to camp overnight wherever they pleased, resulting in a long-term, moderate, beneficial impact because they would have greater opportunities to camp away from others if they so choose. The additional number of dispersed campsites would also impact naturalness and could increase trash. Visitor information and interpretive materials would consist of one general map and brochure for the area. Recreation-specific brochures would not be provided, which would result in visitors being less informed and educated about opportunities available for their particular activity as well as specific “leave no trace” principles and actions recommended to protect resource values. Use levels would increase by approximately 5 percent per year for both motorized and non-motorized use from current levels (which are 200 non-motorized visitors and 250 motorized visitors annually)

Impacts from Cultural Resource Management

Unlike the proposed action, visitors would not be provided with interpretive materials such as signs, brochures, and web-based presentations regarding pre-historic and historic cultural resources. This would inhibit visitors from learning and appreciating the importance of these resources, resulting in a long-term, minor impact on recreation.

Impacts from Fisheries, Riparian and Water Quality Management: Same as Alternative 1.

Impacts from Wildlife Management: Same as Alternative 1.

Impacts from Vegetation Management

Under this alternative, livestock grazing and prescribed burning in the meadows would not occur. Localized, long-term, minor beneficial impacts on recreation would result, because visitors would not have to encounter cattle on the trails. There would also not be temporary trail closures associated with livestock management.

Impacts from Forest Management

Reducing the amount of pre-commercial thinning and hardwood conversions, and not conducting any commercial thinning or oak woodland restoration activities would have much less impact on recreation because there would be less noise generated from chainsaw use and other mechanical equipment, and roads and trail closures would be less likely to occur. Impacts from pile burning would be the same as Alternative 1. Providing special forest products to the public would have no impact on recreation.

Impacts from Fire Management: Same as Alternative 1.

4.10.5 Cumulative Impacts from Recreation Management

Assessment Area: Northern Humboldt County and western Trinity County forested lands

Past, Present and Reasonably Foreseeable Future Actions and Cumulative Impacts

Growing urban development in Eureka, Arcata, McKinleyville, and Fortuna, and associated population growth is expected to contribute to increased demand for recreational opportunities in the region. Although the region has a diversity of coastal trails, reasonably foreseeable future actions are anticipated to add only limited trail mileage in the area. Also, trails for use by mountain bikers, hunters, and hikers with pets are very limited in the area, and mostly located several hours from the area. In addition to the Lacks Creek Management Area, the Lower Trinity Ranger District of Six Rivers National Forest provides over 100 miles of low-maintenance dirt road for motorized vehicle riding, over 60 miles of non-wilderness hiking trail, and nearly 50 miles of non-wilderness trail available for equestrian use. Redwood National and State Parks provide one 11-mile horseback riding trail, over 70 miles of hiking trails, and approximately 30 miles of bike trails, most of which are located on dirt or gravel roads.

Regional opportunities for single track trails allocated specifically for mountain bike use only are very limited. Alternative 1 provides up to 10 miles of trail for this type of mountain biking opportunity. No other recreation use areas are known to currently, or in the future, provide for this specialized use. Horseback riding opportunities in areas closed to motorized vehicle use (such as those found within the management area) are also very limited within the assessment area, while vehicle-oriented recreation and backcountry hiking opportunities are much more available. Provisions for new hiking, biking, horseback riding, motor vehicle riding, and hunting opportunities within the assessment area (other than within the management area) in similar environmental settings in such close proximity to Humboldt Bay population centers are not anticipated within the next 15 years.

4.11 Visual Resources

4.11.1 Impacts under Alternative 1 (Proposed Action)

Impacts from Visual Resource Management

Under all alternatives, visual resource management program is limited to the identification of management classes to protect visual quality while allowing for management actions to continue. The classes do not vary by alternative. This would benefit the visual qualities of the management area.

Impacts from Other Management Programs

Converting roads to trails using heavy mechanical equipment would have a short-term, moderate impact on scenic quality because most all of the vegetation is removed and the resulting landscape along the trail corridor appears barren. After a few years, however, vegetation would regrow, gradually improving the affected area's scenery to be equal or better to pre-treatment

conditions. Decommissioning roads that would not be converted to trails would have short-term negative impacts, but long-term improvements to visual quality by reducing unnatural landscape impacts. Forest thinning projects adjacent to trails are expected to have localized, short-term negative and long-term, minor, beneficial impacts on visual resources as visitors would be able to see into a more natural forest and for greater distances and possibly view more wildlife. Hardwood conversion projects adjacent to trails are expected to have localized, short-term, moderate impacts on visual resources because the large amount of trees on the ground would detract from the area's naturalness and reduce scenic quality. After several years, vegetative growth is expected to hide much of the dead trees, thus improving scenic quality over time. Facility developments would have a localized, long-term, moderate impact on visual resources because the area's naturally-appearing landscape would have additional man-made features. Although the facilities would enhance visitors opportunities to enjoy area scenery, the developments themselves impact the area's naturally appearing scenic quality. All proposed facilities would be designed to minimize disruption of the naturally-appearing landscape. Materials used for construction would appear rustic, thus blending in with the landscape to the maximum extent feasible. Impacts resulting from wildfire suppression activities, particularly heavy equipment use such as bulldozers, would depend on the location of heavy equipment use relative to public use corridors. If they were used on travel routes used by visitors, there would be long-term, moderate impacts to scenic quality because the ground and surrounding vegetation would be heavily altered and appear unnatural. Rehabilitation work after a wildfire would reduce these impacts to the area's scenic quality. Any proposed project such as a prescribed burn, recreation facility development or silvicultural treatment likely to have an impact on visual resources would undergo a "visual contrast rating" to ensure it meets the area's VRM objectives.

4.11.2 Impacts Under Alternative 2

Impacts from Visual Resources Management: Same as Alternative 1

Impacts from Other Management Programs

Impacts would be the same as Alternative 1 except that there would be a slightly greater short-term, minor impact on scenic quality from converting the Midslope Road to a trail. There would be no impact on scenic quality resulting from fire suppression activities as dozers and tracked equipment would not be used. More acres of vegetation treatments would be implemented, resulting in additional minor short-term impacts. The road decommissioning and other watershed restoration activities would be completed on an accelerated schedule, increasing short-term impacts, but reducing the time period which impacts would be highly contrasting (since projects would not be staggered over as many years).

4.11.3 Impacts under Alternative 3: (No Action)

Impacts from Visual Resource Management: Same as Alternative 1

Impacts to Visual Resources from the Other Management Programs

This alternative would have negligible impacts on visual resources because there would be less facilities developed, no roads converted to trails, and fewer acres involved in hardwood

conversion projects. Some long-term improvements to visual quality would also not occur such as restoration of landscape attributes including late successional forests and prairies.

4.11.4 Cumulative Impacts to Visual Resources

Assessment Area: Management Area Viewshed

Past, Present and Reasonably Foreseeable Future Actions and Cumulative Impacts

Past timber harvesting, particularly clearcutting, within the management area's viewshed has had a detrimental impact on scenic quality. Much of the harvested forests within view of the management area have re-grown and now appear more natural. Future actions such as road building and further timber harvesting are likely to occur, but at a much slower rate than what was done previously. Residential home developments are also likely to occur in the future. The cumulative impacts of these various activities are anticipated to have long-term, minor to moderate effects on the area's scenic qualities. Most of actions proposed under Alternatives 1 and 2 of this plan, such as forest and prairie restoration, would offset the actions of commercial forest management and other developments within the viewshed. Recreational facility development under Alternatives 1 and 2 would be a negligible addition to regional scenic quality impacts and would only be visible to foreground (close-in) viewers. All actions in Alternative 3 would have no or negligible cumulative impacts.

4.12 Wild & Scenic Rivers (WSR)

4.12.1 Impacts Under Alternative 1 (Proposed Action)

Impacts from WSR Management

The impacts of WSR Suitability Determination and Interim Management Requirements for Lacks Creek were analyzed in the Arcata RMP (1995). This decision and associated analysis is carried forward in this plan under all alternatives, so no additional impacts have been identified.

Impacts from the Other Management Programs

Decommissioning roads within the WSR corridor is expected to result in localized, short-term, minor impacts on wild and scenic river values because of the temporary increase in sediment into Lacks Creek, which could affect fish spawning and rearing habitat. The long-term benefits from road decommissioning, however, far outweigh the short-term impacts. Trail use by hikers, and trail construction and maintenance is expected to have localized, long-term, negligible impacts on WSR values because the potential increased sediment is not likely to affect any spawning or rearing habitat. A more detailed description of the impacts of Alternative 1 on watershed and anadromous fisheries values (the outstandingly remarkable value that the suitability recommendation is based upon) are contained in the Fisheries, Riparian and Water Quality impacts discussion.

4.12.2 Impacts Under Alternative 2

Impacts from WSR Management: Same as Alternative 1

Impacts to WSR's from the Other Resource Programs: Same as Alternative 1

4.12.3 Impacts under Alternative 3 (No Action)

Impacts from WSR Management: Same as Alternative 1

Impacts to WSR's from Other Management Programs

The reduced levels of watershed and vegetation restoration proposed under this alternative would result in less beneficial watershed and fisheries impacts & therefore would not enhance WSR values. Impacts from other programs would remain at current levels.

4.12.4 Cumulative Impacts to Wild and Scenic Rivers

No cumulative impacts have identified based on the actions proposed under any of the alternatives.

4.13 Fire Management

4.13.1 Assumptions and Incomplete Information

Fire Suppression Assumptions

- Predicting incidence and size of wildland fires is highly speculative and depends on many factors including weather conditions, fuel availability, topographic features, the presence of ignition sources (both human and natural), as well as firefighting resource availability based on other fire activity within the geographic area and national resource commitment. Therefore analyses are based upon potential impacts and are expressed in qualitative terms rather than quantitative acreage estimates.
- The Lacks Creek Management Area annually experiences high to extreme fire danger with the potential for a high-intensity watershed event.
- Wildfire occurrences with similar fuel types and terrain features in the county have exhibited wide ranges of fire intensity and severity, from creeping and smoldering to timber stand replacement events.
- During emergency situations, restricted firefighting tactical operations (e. g.: dozer line construction on steep slopes) may become necessary. This shall be determined on a case-by-case basis, taking into account the items listed under Alternative 1.

Prescribed Fire Assumptions

- The Lacks Creek Management Area is not adjacent to any significant wildland/urban interface (WUI) areas. Therefore, prescribed fire and fuels reduction shall not be a stand alone program, but used as a restoration tool to support resource management goals related to vegetation, forest management, terrestrial and aquatic wildlife, and recreation.

- Prescribed fire was historically utilized by ranchers and timber companies in the Lacks Creek area, and Native Americans used fire as a landscape tool in the Redwood Valley.
- Burning will only occur with authorization from the North Coast Unified Air Quality Management District.
- Prescribed fire plans will be prepared for individual burns that will provide burn objectives, prescriptions, and contingency plans in case the prescription is exceeded or suppression action is needed.
- All prescribed fire prescriptions shall be for low intensity fire behavior and will occur outside of fire season during the late fall, winter, and early spring months.
- For pile and broadcast burning of slash residues, burn prescriptions will be developed to consume small diameter material, and leave some of the larger dead and downed woody material. Live fuels will not be targeted for consumption.
- Broadcast burning of prairies and oak woodlands will target grasses, forbs, and small live brush and tree species.
- Large snags shall not be targeted for burning unless necessary to maintain control lines.

Table 4.1 Illustrates the Allowable Percent Consumption of Fuels by Size Class:

Prescribed Fire Type	Targeted consumption of fuels by size class (%)					
	Dead fuels				Live fuels, trees and brush	
	1-hour, < ¼"	10-hr, ¼ to 1"	100-hr, 1 to 3"	1000-hr, > 3"	< 8" dbh	> 8" dbh
Pile Burning	95-100	95-100	0-80	0-50	0-10	0-2
Broadcast Burning, slash residues	70-100	70-100	0-50	0-30	0-10	0-2
Broadcast Burning, prairie and oak woodland restoration	80-100	n/a	n/a	n/a	80-100	0-2

Incomplete Information

Fire Suppression

- Although the Lacks Creek Management Area annually experiences high to extreme fire danger with the potential for a high-intensity watershed event, there is an absence of recorded wildfire occurrences.

Prescribed Fire

- Although prescribed fire was historically utilized by ranchers and timber companies in the Lacks Creek area, and Native Americans used fire as a landscape tool in the Redwood Valley, specific records of prescribed burns do not exist.

4.13.2 Impacts under Alternative 1 (Proposed Action)

Impacts from Fire Management

Potential impacts from high intensity wildfire, such as erosion, sedimentation, habitat loss, decreased air quality, deforestation, and threats to private property and public safety necessitate wildfire suppression actions. However, many decades of suppressing all wildfires within northern California forests has led to increased fuel loading, and consequently, could increase the risk of a potentially damaging event. Although many plant and animal species within the northern coastal mountain ranges of California have adapted to wildfire occurrence, wildland fire use (allowing naturally occurring fires to burn within prescription to meet resources management objectives) would not be pursued due to the area's size, topography, and vicinity to private property. In the long-term, the need to suppress wildfires is in direct conflict with healthy forest fuels conditions and the area's ability to resist damages associated with high intensity wildfire. Therefore, increased fuel loading over time would be partially offset, as funding allows, through forest and other vegetation treatments.

Under Alternative 1, all fire suppression actions, SOPs, and equipment restrictions represent a balance between the potential damages associated with fire suppression activities upon resource values and the urgency for fire suppression. By allowing dozer use along ridgelines and slopes up to 45 percent (when warranted) the impacts to fire suppression operations are expected to be minor.

Limited authorized burn days, as determined by the North Coast Unified Air Quality Management District, may have a moderate impact to prescribed fire operations. Some treatments may be delayed for several seasons. These air quality authorization impacts are included for analysis purposes, but are beyond the scope/authority of this planning process.

Impacts from Cultural Resource Management

Delayed line production or abandoning and relocating fire lines in order to avoid damage to cultural resources may have moderate impacts to a wildfire suppression response. These delays may lead to wildfires burning larger areas and/or longer commitment times for firefighting resources, but are unavoidable in order to preserve culturally significant resources. In order to minimize damage to cultural resources and expedite the fire suppression response, the BLM cultural representative assigned to the wildfire would work with the Fire Manager and/or CALFIRE Incident Commander and/or Command Team to identify areas of known or suspected cultural resources sites. Actions will be taken in these identified areas to avoid and protect sensitive sites from damage by heavy mechanical equipment. The BLM Agency Representative will coordinate suppression efforts in culturally sensitive areas with the Arcata Field Office Archaeologist. The BLM Agency Representative will also ensure that coordination and consultation with local federally recognized Tribal governments has taken place.

Preservation of cultural resources may have minor impacts to prescribed fire activities by requiring the re-configuration of burn units. Consultation and coordination with the Arcata F.O. Archeologist will be conducted prior burn plan development.

Impacts from Fisheries, Riparian and Water Quality Management

During emerging and extended attack incidents, firelines are usually located along ridge tops and existing barriers. For this reason, impacts to fire suppression operations by restricting firefighting suppressant, retardant, and foam application within waterways, and restricting dozer use within riparian areas, are expected to be negligible.

Managing pump sites, staging areas, and safety zones for potential toxic chemical spills from firefighting equipment is recognized throughout the firefighting agencies as a standard best management practice. Increased logistical needs associated with these practices shall have negligible impact to firefighting efforts.

Managing for fisheries, riparian, and water quality values are not expected to impact prescribed fire and fuels management.

Impacts from Wildlife Management

Managing for wildlife resource values are not expected to impact fire suppression operations.

Limiting disturbance within nesting areas through seasonal restrictions shall moderately impact fuels reduction and prescribed fire activities. Some treatments may be delayed for several seasons as the windows for operations may be limited to November (after potential for wildfire has decreased) through mid-December (when snowfall makes project areas inaccessible).

Impacts from Vegetation Management

Vegetation management directly impacts fuel loading, which affects the potential size, intensity, severity, and resistance to control of wildfires.

Prairie maintenance and grazing could be beneficial to wildfire suppression operations by decreasing fuel loading over nine project areas. This decreases potential fire intensity and decreases a wildfire's resistance to suppression operations. Although ignition potential is greater in open grass than timber litter over a lengthier seasonal window, grass fuels reach the moisture of extinction more readily than forest fuels. Grass fuels are more responsive to diurnal weather patterns, increasing internal fuel moisture and decreasing fire intensity at a fast rate as nighttime relative humidity increases. Wildfires within grass fuels, although often fast moving, are easier to slow with standard firefighting tactics than wildfires within timber fuels. Grass fires usually require a shorter commitment time for firefighting resources to secure and mop-up, making resources available for other incidents. Maintaining prairies also allows for rapid insertion of firefighting crews by helicopter. Essentially, the significant decrease in fuel loading makes it easier to fight a wildfire.

Impacts from Forest Management

Silvicultural practices such as thinning and piling increases available fuel loading within the treatment area for the short-term until prescribed fire and fuels reduction are completed the following year. Lop and scatter techniques increases flashy fuel loading for two to five years until the fine fuels have melted down to the forest floor. However, silvicultural treatments designed to accelerate the development of late successional forest characteristics would have significant positive impacts to wildfire suppression operations over the long-term. Mature

forests with a closed canopy and shaded understory are resistant to high intensity fire and typically exhibit slow moving ground fire events.

Managing for private and commercial firewood would have moderate impacts to fire suppression operations in the short-term, but have significantly beneficial impacts over the long-term. Wildfire potential is increased during the first fire season following a firewood sale. However, upon completion of fuels reduction activities in the following fall the fuel loading is significantly reduced. The treated area becomes resistant to a high intensity wildfire event for ten to twenty years.

Increased silvicultural treatments and oak woodland restoration would have beneficial impacts to wildfire suppression operations through significantly decreased fuel loading on the treatment areas (see Vegetation Management).

Managing for mushrooms or other special forest products is not expected to impact wildfire suppression operations.

Impacts from Recreation and Transportation Management

Any increase in recreational use also increases the potential for unintended human-caused ignitions. Seasonal fire restriction, patrol, and enforcement can significantly decrease this potential. Given the historical absence of human caused wildfires within the Lacks Creek area, impacts to wildfire potential from projected increased visitor use are expected to be minor. The potential, however, is difficult to predict.

Road and trail upgrading will have a beneficial impact to fire suppression responses by increasing vehicle and crew accessibility, and roads and trails are commonly used as fire lines during fire suppression operations.

Road decommissioning may slow initial attack response times and increase logistical needs during extended attack fires. However, since most of the roads slated for decommission have been abandoned and not been maintained, these impacts are expected to be minor. Furthermore, the development and maintenance of trails along decommissioned roads would provide established crew access routes and pre-existing fire lines within the Lacks Creek area.

Designated backcountry campsites with established fire rings would decrease the potential of escaped campfires by providing established areas with localized low fuel loading. Given the historical absence of human caused wildfires within the Lacks Creek area, impacts to wildfire potential from projected increased visitor use are expected to be minor. The potential, however, is difficult to predict, and these protective limitations on visitor use are deemed necessary based on the high value of the resources and potential for major fire events in the area.

Impacts from Visual Resources Management

Managing for visual resources is not expected to impact wildland fire ecology and management. Fuels treatments and prescribed burns would be implemented to meet long-term VRM class objectives, and minimal project design restrictions are expected. Wildfire rehabilitation activities would need to be designed to meet VRM class objectives.

4.13.3 Impacts under Alternative 2

Impacts from Fire Management

An absolute restriction upon dozer use during wildfire operations could delay fireline construction and lead to larger fires, longer exposure of natural and man-made values to a potentially damaging event, and a longer commitment of firefighting resources. This could lead to major negative impacts, however this is a very general conclusion and the specific potential cannot be accurately predicted with available information.

Impacts from Vegetation Management

By increasing the footprint of prairie maintenance over the proposed action, fire suppression operations could see a slight benefit by this alternative of an additional 114 acres treated and/or maintained in state of low fuel loading.

Impacts from Recreation and Transportation Management

Converting the Midslope Road to trail may delay fire suppression resources from accessing that part of the Lacks Creek area. This could cause greater impacts to fire suppression operations than other alternatives, but the potential is not quantifiable.

Impacts from all other programs: Same as Alternative 1

4.13.4 Impacts under Alternative 3 (No Action)

Impacts from Fire Management

Under the no action alternative, fuel loading within the Lacks Creek area would increase over time and could have a moderately negative impact to wildfire suppression operations. The potential for a wildfire highly resistant to suppression operations would increase.

Impacts from Vegetation Management

The reduction in prairies over time could have moderately negative impacts to wildfire suppression through the steady increase in fuel loading. The potential for a wildfire highly resistant to suppression operations would increase.

Impacts from Forest Management

Limiting pre-commercial thinning (160 acres) and hardwood conversion (40 acres), and the absence of commercial thinning and oak woodland restoration would have moderately negative effects upon wildfire suppression operations within the Lacks Creek area through a steady increase in fuel loading over time. The potential for a wildfire highly resistant to suppression operations would increase.

Impacts from Recreation and Transportation Management

Fewer recreation access opportunities would be provided under this alternative, resulting in smaller increases in visitation levels and less sources for unintended ignitions. However, the

benefits associated with Alternative 1 (restricting camping and fires to designated sites) would not be recognized under Alternative 3, so the overall impact to fire could be higher.

Impacts from All Other Programs: Same as Alternative 1

4.13.5 Cumulative Impacts from Fire Management

Assessment Area: Lacks Creek and Upper Redwood Creek Watershed.

Past, Present and Reasonably Foreseeable Future Actions and Cumulative Impacts: The Redwood Valley area experiences high fire danger annually, and the potential for a landscape-wide wildfire event is present under extreme weather conditions. This potential occurs annually throughout undeveloped lands in northwest California forests. Over the last 108 years there have been twelve recorded wildfires that grew to over 100 acres in the Redwood Valley. The largest were 3,183 acres, 829 acres, 557 acres, 424 acres, and 240 acres. The remaining seven were less than 200 acres. Most of these wildfires occurred in the 1950s and 1960s, with the causal agent reported as “Land Clearing”. Only one reported fire was the result of an incendiary device (arson) and it was controlled at 158 acres in 1959.

Over the last 30 years in the Redwood Valley wildland fuels have been successfully managed through active timber harvest, grazing management, forest health, and prescribed fire programs, conducted by private timber companies, ranches, the National Park Service, and the BLM. Fuels management in Lacks Creek through the forest health and vegetation treatments in the Alternative 1 and Alternative 2 are expected to decrease the potential for a landscape-wide wildfire event in the Redwood Valley. Given the dynamic and opportunistic nature of fire suppression activities, the degree by which this benefit may be realized is speculative and very difficult to quantify. Under Alternative 3, the lack of fuels reduction in Lacks Creek would most likely increase the potential for a landscape-wide wildfire event in the Redwood Valley, but not to a great extent.

The moderate restrictions upon heavy equipment use during fire suppression operations set forth in Alternative 1 and Alternative 3 are expected to have a negligible effect upon the potential size, intensity, or longevity of wildfire events in the Redwood Valley. Under Alternative 2, absolute restrictions upon heavy equipment use during fire suppression operations increases the potential for a wildfire to escape Lacks Creek and move into other parts of the Redwood Valley, however the degree by which this potential may be realized is speculative in nature.

Chapter 5 -- Consultation and Coordination

5.1 Introduction

This document has been prepared with input from and coordination with interested agencies, organizations, and individuals. Public involvement is a vital component of NEPA for vesting the public in the planning process and allowing for full environmental disclosure. Guidance for implementing public involvement is codified in 40 CFR 1506.6, thereby ensuring that federal agencies make a diligent effort to involve the public in preparing NEPA documents.

Public involvement for the Lacks Creek Management Plan has included several phases, as follows:

- Preliminary discussions with staff from Redwood National and State Parks, user groups and other individuals and agencies to collect baseline information and determine the context for planning;
- A formal public scoping period and meeting prior to alternative development and analysis to obtain public input on issues and some initial plan proposals; and
- Public review and comment on this preliminary plan and EA.

5.2 Summary of Scoping Process and Issues

Public Outreach: The scoping period was held from April 20, 2007 through June 9, 2007. A letter announcing the scoping period was mailed on April 20 to local organizations, landowners and members of the public on the Lacks Creek mailing list. A news release issued on April 20, 2007 announced the management planning process, scoping period and public scoping meeting. The Eureka Times Standard published a feature article on the area and the management planning process and scoping period on May 11, 2007.

Scoping Meeting: A Scoping Meeting was held at 6 PM on May 16, 2007 at the BLM Arcata Field Office. Twenty-three people attended this meeting. The BLM presented a power-point slideshow highlighting existing management direction for Lacks Creek from the Arcata Resource Management Plan, preliminary issues, and some initial management ideas developed by the staff. The presentation was followed by a question and answer period and input from members of the public. The input was summarized on flip charts and the audience was also encouraged to submit written comments.

Written comments: The BLM Received 10 written comments from organizations and individuals. Organizations providing comments included:

- North Coast Environmental Center
- Backcountry Horsemen of California, Redwood Unit
- Redwood National and State Parks (individual staff member)
- International Mountain Bicycling Association

Comment summary

The following ideas and concerns were provided by commentors during the scoping meeting and through written letters/e-mails. The letters and e-mails are available for review at the Arcata Field Office.

Recreation Use

There was general consensus that provision of additional recreation opportunities in Lacks Creek would be good for residents and visitors to the region. Commentors requested development of trails, including mountain bike and equestrian routes, and stressed the need to design and manage trails in a manner that minimizes conflicts between user groups. Rustic campgrounds and water developments and adequate trailhead parking were also requested. There is concern about potential misuse of the area and the importance of providing adequate enforcement. There was also interest in keeping any developments low-key and rustic to keep the current remote character of the area.

Private Land/Neighboring Land

In general, area residents also supported recreation access into the area if access is managed to minimize impacts to neighboring landowners. Recommendations included designing trails so that they don't lead to private property, and clearly directing visitors to public trailheads so that they don't trespass trying to reach the area. Adequate signing of public land boundaries and the placement of fences and gates to delineate boundaries were other recommendations to minimize trespass.

Ecosystem restoration

There was broad support for the restoration concepts outlined for the area. Specifically, prairie restoration was cited as important goal, with emphasis on encouraging/using native plants in restoration. There was interest in restoring and maintaining a balance between prairies, old growth and stream habitat protection. Several commentors stressed the importance of maintaining access roads into treatment/restoration areas for crews and equipment. One commenter recommended continued grazing to restore prairies –owners of an adjoining ranch expressed interest in cooperating on prairie and oak woodland restoration, and improvement of elk habitat.

Fire

There was considerable concern expressed about fire danger from increased public use and an interest in maintaining a road network for fire suppression. Commentors supported reintroducing prescribed fire into oak woodlands. Other recommendations included maintaining existing water developments and developing new ones for use during fires, and assessing/mitigating impacts of increased public use on fire danger.

Roads/Transportation

Neighboring residents expressed concerns about roads. Concerns centered on safety issues and additional wear and tear from increased public use of Bair Road, the county road accessing Lacks Creek. Recommendations included completing an analysis of new use levels to ensure that conflicts and impacts will not occur to roads and provision of BLM funding to support the

county's increased maintenance costs. There was also interest in improving maintenance of the BLM road network to prevent resource impacts to the watershed.

General

Other concerns included:

- Support for a continued “open style” of local and regional community participation in planning and management of the area.
- Concern about marijuana growing as a problem in the area and the need for law enforcement.
- The need to protect archaeological sites.

5.3 Additional Contacts Made by BLM Staff during the Planning Process

The following contacts were made by BLM planning team members (Names in parenthesis) during preparation of this document.

(Brad Job, Engineer)

- Joe Seney, Natural Resource Conservation Service (NRCS) regarding soil mapping that NRCS completed in Lacks Creek Watershed.

(Jennifer Wheeler, Botanist)

- Josh Seney Redwood Creek Ranch caretaker. Phone call January 12, 2007 and meeting January 24, 2007.
- Charles Barnum, January 12, 2007. Phone call.
- Calisa Holm. Barnum timber grazing lessee. Phone call January 12th, 2007 and meeting January 24, 2007.
- Jeff Dayton, California Department of Fish and Game phone calls: January 22 & 25, 2007.
- Leonel Arguello Redwood National and State Parks. e-mail dated January 17, 2007.

(Dave Fuller, Fisheries Biologist)

- Presented overview of preliminary plan to the California Coastal Provincial Advisory Committee on April 25, 2007.
- Presented overview of preliminary plan to the Redwood Creek Watershed Group on May 31, 2007.
- Presented overview of preliminary plan to the Northwest BLM Resource Advisory Committee, July 2007.
- Presentation of plan to the Redwood Creek Sediment Reduction Planning Group on February 29, 2008.
- Mitch Farro, Pacific Coast Fish Wildlife and Wetlands Restoration Association via e-mail, phone, and in person (from March 2007 to present).
- Wendy Cole and Clarence Hostler of National Marine Fisheries Service, e-mail, phone, personal contact, site visits (from October 2007 to present). Jamie Roscoe Humboldt State

University Professor via phone in November 2007. Debbie Duckworth, National Marine Fisheries Service. Personal contact in July, 2008.

- Darci Short and Greg Bundros, Redwood National and State Parks, multiple meetings and phone conversations in 2007 and 2008.

(Bruce Cann, Outdoor Recreation Planner)

- Meeting with the "Redwood Empire Endurance Riders" (Karen Brooks, Donna Biteman, Elaine Kerrigan) and Dennis Mayo (advocate for public access) on Jan. 25, 2008. Focused on equestrian and other public access into area.
- Meeting/Field Tour with Bigfoot Mountain Bike Club Land Access Director Rocky Brashear, May 30, 2008 to discuss mountain bike trails/access.

(David Anthon and Arlene Koscic, Wildlife Biologists)

(Sam Morrison, Geologist)

- Phone Call, J. Seney, NRCS, 10/19/2007 regarding Lacks Creek Soils/Geology

5.4 List of Preparers

Lynda Roush	Field Manager	Management Direction
Kathy Stangl	Assistant Field manager	Co-team lead/management direction
Bob Wick	Planning and NEPA Coordinator	Co-team lead, social and economic, ACECs
Bruce Cann	Recreation Planner	Recreation, Visual Resources, Transportation, Wild and Scenic Rivers
Jennifer Wheeler	Botanist	Vegetation, grazing
David Fuller	Fisheries Biologist	Fisheries, riparian, watershed
Brad Job	Engineer	Soils, Transportation
David Anthon	Wildlife Biologist	Wildlife
Arlene Koscic	Wildlife Biologist	Wildlife
Henry Harrison	Forest Ecologist	Forest Management, Special Forest Products
Greg Jennings	Forest Ecologist	Forest Management, Special Forest Products
Tim Jones	Fire Management Officer	Fire, Fuels Management
Jarred Hammatt	Fuels Specialist	Fuels Management
Paul Fritze	Geographic Information System (GIS) Specialist	Mapping
Clara Sanders	Realty Specialist	Realty
C. David Johnson	Archaeologist	Cultural Resources
Sam Morrison	Geologist (retired)	Geology, Soils

Chapter 6 -- References

Baumhoff, Martin A.

1925. California Athabascan Groups. University of California Publications Anthropological Records 16 (5):201-209. University of California Press, Berkeley, California.

Bjorkstedt, Eric P., Brian C. Spence, John Carlos Garza, David G. Hankin, David Fuller, Weldon E. Jones, Jerry J. Smith, and Richard Macedo.

2005. An analysis of historical population structure for evolutionarily significant units of Chinook salmon, coho salmon, and steelhead in the North-Central California Coast Recovery Domain. U. S. Dept. Commerce., NOAA Tech. Memo. NMFS-SWFSC-382. 210 pp.

Bundros, G.J., D.Short, B.E. Barr, V.C.Hare.

2003. Upper Redwood Creek watershed road assessment summary report: Redwood National and State Parks report to the Pacific Coast Fish, Wetlands, and Wildlife Restoration Association, unpublished. 137 pp.

California Climate Change Center.

2006. Our Changing Climate –Assessing the Risks to California – A Summary Report from the California Climate Change Center, 16 pgs.

http://meteora.ucsd.edu/cap/pdffiles/CA_climate_Scenarios.pdf

California Department of Finance Research.

2008. Census 2000 Report. Demographics (Excel Spreadsheet)

<http://www.dof.ca.gov/HTML/DEMOGRAP/SDC/SDC-Products.php#viewdocs->

California Department of Water Resources.

2008. California State Climatologist; temperature and precipitation data for North Coast Hydrologic Stations.

http://www.climate.water.ca.gov/climate_data/northcoast.cfm)

California Department of Fish and Game

2002. California Natural Diversity database. <http://www.dfg.ca.gov/biogeodata/cnddb/>

California Native Plant Society

2001 (Updated online, 2008). CNPS Inventory of Rare and Endangered Plants.

<http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi>

Cannata, S., R. Henly, J. Erler, J. Falls, D. McGuire and J. Sunahara.

2006. Redwood Creek Watershed Assessment Report. Coastal Watershed Planning and Assessment Program and North Coast Watershed Assessment Program. California Resources Agency and California Environmental Protection Agency, Sacramento California.

Cashman, S. M., Kelsey, H. M., and Harden, D. R.

1995. Geology of the Redwood Creek Basin, Humboldt County, California in Geomorphic Processes and Aquatic Habitat in the Redwood Creek Basin, Northwestern California, US Geological Survey Professional Paper 1454-A

Goddard, Pliny E.

1914. Chilula Texts. University of California Publications in American Archaeology and Ethnography, Vol. 18. pp. 15-33. University of California Press, Berkeley, California.

Greenlee, Jason M., and Jean H. Langenheim

1990. Historic Fire Regimes and Their Relation to Vegetation Patterns in the Monterey Bay Area of California. *American Midland Naturalist*, Vol. 124, No. 2 (Oct., 1990), pp. 239-253.

Hamer, T. E. and S.K. Nelson.

1995. Characteristics of Marbled Murrelet Nest Trees and Nesting Stands *In Ecology and Conservation of the Marbled Murrelet*. C.J. Ralph, G.L. Hunt, Jr., M.G. Raphael, J.F. Piatt, technical eds. Gen. Tech. Rep. PSW-GTR-152. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; 420p.

Harden, Deborah. R., Kelsey, H.M., Morrison, S. D., Stephens, T.A.

1981. Geologic Map of the Redwood Creek Drainage Basin, Humboldt County, California Water Resources Investigations. Open File Report 81-496 WR1-OFR 81-496

Harden, Deborah R. Colman, Steven, M., Nolan, K. Michael

1995. Mass Movement in the Redwood Creek Basin, Northwestern California in Geomorphic Processes and Aquatic Habitat in the Redwood Creek Basin, Northwestern California. US Geological Survey Professional Paper 1454-A

Harris, S. W., and L. Harris.

1979. Bird narratives. Vol. II *In California wildlife/habitat relationships program*. North Coast/Cascades Zone. B. G. Marcot, ed. U.S. Department of Agriculture Forest Service, Six Rivers National Forest, Eureka, CA.

Hicks, B. J., J. D. Hall, P. A. Bisson, J. R. Sedell.

1991. Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats. pp. 483-518. American Fisheries Society Special Publication [Am. Fish. Soc. Special Pub.]. no. 19.

Humboldt County

2007. Humboldt County General Plan, Preliminary Hearing Draft, May 17, 2007, Economic Development Element 22 Pgs.

<http://co.humboldt.ca.us/planning/gp/PrelimHearingDraft/Group4/Chapter11EconomicDevelopment04-18-07Posted.pdf>)

Humboldt County.

1999. Prosperity! The North Coast Strategy, 12 pgs.

<http://www.northcoastprosperity.com/files/webfm/contents/prosperity.pdf>

- Kelsey, H. M, Coghlan, M., Pitlick, J. and Best, D.
1995. Geomorphic analysis of streamside landslides in the Redwood Creek Basin, northwestern California in Geomorphic Processes and Aquatic Habitat in the Redwood Creek Basin, Northwestern California, US Geological Survey Professional Paper 1454-A
- Klein, R.D.
1987. Stream Channel Adjustments Following Logging Road Removal in Redwood National Park. Redwood National and State Parks Watershed Rehabilitation Technical Report Number 23. Arcata, California. 38 p.
- Kroeber, A. L.
1970 *Handbook of the Indians of California*. California Book Company, Ltd., Berkeley, California.
- Langenheim and Greenlee.
1990. Historic Fire Regimes and Their Relation to Vegetation Patterns in the Monterey Bay Area of California. *Am. Midl. Nat.* 124:239-253.
- Lewis, J. C. and Stinson, D. W.
1998. *Washington State Status Report for the Fisher*. 64. Olympia, Washington, USA: Washington Department of Fish and Wildlife.
- McDonald, P.M.
1988. Montane hardwood. In *A Guide to Wildlife Habitats of California*. K. E. Mayer and W. F. Laudenslayer, Jr., eds. State of California, Resources Agency, Department of Fish and Game. Sacramento, CA. 166 pp.
- Madej, M. A.
2001. Erosion and Sediment Delivery Following Removal of Forest Roads. *Earth Surface Processes and Landforms* 26:175-190.
- Mossman, A.
1979. Mammal Narratives. Vol. III *In California Wildlife/Habitat Relationships Program*. North Coast/Cascades Zone. B. G Marcot, ed. U.S. Department of Agriculture Forest Service, Six Rivers National Forest, Eureka, CA.
- Naeem, Sahid, Lindsey J. Thompson, Sharon P. Lawler, John H. Lawton & Richard M. Woodfin.
1994. Declining biodiversity can alter the performance of ecosystems, *Nature*, 368:734-736, 21 April 1994.
- National Oceanic and Atmospheric Administration.
2008. Average Annual Precipitation, Northern California, 1961-1990 (Map)
http://www.wrh.noaa.gov/eka/climate/annual_rain.gif
- Nolan, K.M., Kelsey, H.M., and Marron, B. C.

1995. Geomorphic Processes and Aquatic Habitat in the Redwood Creek Basin, Northwestern California, US Geological Survey Professional Paper 1454-A

North Coast Watershed Assessment Program

2006. Redwood Creek Watershed Assessment Report, California Resources Agency.

Powell, R. A. and W.J. Zielinski.

1994. Fisher. *in* The Scientific Basis for Conserving Forest Carnivores: American Marten, Fisher, Lynx, and Wolverine: pp 38-73.

Powell, R.A., S.W. Buskirk, and W.J. Zielinski.

2003. Fisher and Marten *in* Wild Mammals of North America: Biology, Management, and Conservation, chapter 29; G.A.Feldhamer, B.C. Thompson, and J.A. Chapman, eds. second edition. Johns Hopkins University Press.

Redwood National and State Parks webpage.

2007. Bald Hills: <http://www.shannontech.com/parkvision/redwood/Redwood15.html#baldhills>

Redwood Creek Watershed Group.

2006. Redwood Creek Integrated Watershed Strategy, 110 pages.

https://216.102.9.253/planning/Prop50/01_RWC_IWS%20Final.pdf

Ruggerio, L. F., K. B. Aubry, S. W. Buskirk, L. Jack Lyon, and W. J. Zielinski, eds.

1994. Gen. Tech. Rep. RM-254. Fort Collins, CO: U.S. Dept. Agric., Rocky Mountain For. and Range Exp. Sta. 183 pp.

Schulze, Ernst-Detlef, Christian Wirth, Martin Heimann.

2000. Climate Change: Managing Forests After Kyoto, Science, 22 September 2000: Vol. 289. no. 5487, pp. 2058 – 2059 <http://www.sciencemag.org/cgi/content/summary/289/5487/2058>

Stein, William.

1997. Wildlife on White Oaks woodlands. Woodland Fish and Wildlife. World Forestry Center 4033 SW Canyon Road, Portland, Oregon, 97221

Stein, William.

Date N/A. Oregon White Oak. Oregon State University, Corvallis. PhD thesis.

http://www.na.fs.fed.us/pubs/silvics_manual/volume_2/quercus/garryana.htm

Union of Concerned Scientists.

2008. Confronting Climate Change in California (Webpage)

http://www.ucsusa.org/global_warming/science/confronting-climate-change-in-california.html

U. S. Census Bureau.

2000. Census 2000 Population, Demographic, and Housing Data. U. S. 2000 Census

Quicklinks: Humboldt County, CA, <http://quickfacts.census.gov/qfd/states/06/060231k.html>

United States Department of Agriculture (USDA), Natural Resources Conservation Service.
2006. Final Soil Data for Redwood Creek Watershed, Soil Survey 2006, Arcata Soil Survey Office, Arcata, CA

USDA, Natural Resources Conservation Service
2005. Draft Soil Data for Lacks Creek Watershed, May 12, 2005, Soil Survey Project, Redwood National and State Parks, Arcata Soil Survey Office, Arcata, CA

United States Department of Interior (USDI).
2001. Secretary Order 3226, Evaluating Climate Change Impacts in Management Planning, USDI Office of the Secretary http://elips.doi.gov/elips/sec_orders/html_orders/3226.htm

USDI Bureau of Land Management-USDA Forest Service.
1994. Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (73 pgs). Standards and Guidelines for Management of habitat for Late Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl 143 pgs. U.S. Government Printing Office, 1994 –589-111/00001 Region No. 10.

USDI Bureau of Land Management.
1995. Arcata Planning Area Proposed Resource Management Plan Amendment and Environmental Assessment. U.S. Department of the Interior, Bureau of Land Management, Arcata Resource Area. March 1995. Arcata, CA.

USDI Bureau of Land Management.
1980. Visual Resource Management Program, BLM Handbook printed by the Government Printing Office, 38 pgs.

Wallace, William J.
1978 Hupa, Chilula and Whilkut. In *California*, edited by Robert F. Heizer, pp. 164-179. Handbook of North American Indians, vol. 8, Smithsonian Institution, Washington, D.C.

Williams, B. K., R. C. Szaro, and C. D. Shapiro.

2007. Adaptive Management: The U.S. Department of the Interior Technical Guide. Adaptive Management Working Group, U.S. Department of the Interior, Washington, DC.

Appendices

Appendix A -- Standard Operating Procedures

A-1 Fisheries, Riparian and Water Quality

The following standards and guidelines are outlined in the Northwest Forest Plan (USDA/USDI 1994)

Mitigations/Conditions of Operation for Routine Road Maintenance:

Applicable Standards and Guidelines:

RF-2e. Minimize disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow.

RF-2f. Restrict sidecasting as necessary to prevent the introduction of sediment into streams.

RF-5. Minimize sediment delivery to streams from roads. Outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is unfeasible or unsafe. Route road drainage away from potentially unstable channels, fills, and hillslopes.

RF-6. Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams.

Additional Criteria (as directed by RF-2.d)

A. All above activities will not occur during wet weather. BLM will inspect road conditions prior to initiating any routine road maintenance activity.

B. Heavy equipment operations will use all feasible techniques to prevent any sediment from entering a drainage system during operations. For example, operators will take precautions when operating near drainages to keep surface materials out of the stream channel. Only operators who are informed of all applicable Standards and Guides and conditions of operation will be permitted to commence work. A BLM project inspector, or designee, will be onsite to insure proper procedures are followed.

C. Heavy equipment will be inspected daily by the BLM project inspector, or designee, to check for leaks. Equipment that may leak lubricants or fuels into drainages will not be used until leaks are repaired. Equipment operators will be required to carry absorbent pads (or equivalent) designed to absorb and contain any leaks which may occur during operations. Fuel trucks (if used) and/or re-fueling will be done outside of Riparian Reserves and stream crossings.

D. Vegetation trimming or removal conducted in Riparian Reserves will be completed in such a fashion as to not retard attainment of Aquatic Conservation Strategy objectives. Specifically: 1)

Downed woody material in Riparian Reserves will not be removed and will be moved only to the extent necessary to provide for safe road use. 2) Conifers exceeding three inches diameter will not be cut from Riparian Reserves unless it is absolutely necessary for safe use of the road segment. If a conifer exceeding three inches diameter must be cut, it may not be moved from the Riparian Reserve or stream corridor without review from a BLM fishery biologist or designee.

E. Water drafting will be conducted only at sites approved by BLM staff. Intake hoses will be screened to prevent entrainment of fish. If possible water drafting will occur in non-fish-bearing streams. Vehicle approaches will be inspected by BLM personnel or designees to insure damage to riparian areas is minimized.

**Mitigations/Conditions of Operation for Road Repairs:
Applicable Standards and Guidelines:**

RF-2e. Minimize disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow.

RF-2f. Restrict sidecasting as necessary to prevent the introduction of sediment into streams.

RF-3a. Reconstruct roads and associated drainage features that pose substantial erosion risk.

RF-3b. Prioritize road reconstruction based on current and potential impact to riparian resources and the ecological value of the riparian resources affected.

RF-4. New culverts, bridges, and other stream crossings shall be constructed, and existing culverts, bridges, and other stream crossings determined to pose a substantial risk to riparian conditions will be improved, to accommodate at least the 100-year flood, including associated bedload and debris. Priority for upgrading will be based on the potential impact and ecological value of the riparian resources affected. Crossings will be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of a crossing failure.

RF-5. Minimize sediment delivery to streams from roads. Outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is unfeasible or unsafe. Route road drainage away from potentially unstable channels, fills, and hillslopes.

RF-6. Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams.

Additional Criteria (as directed by RF-2.d)

A. All non-emergency road repairs will occur only when road conditions are not wet and when the chance of precipitation is minimal.

B. Bridge replacements will be conducted only during times of low streamflow but prior to upstream migration of adult anadromous salmonids. Replacement activities will avoid, to the

maximum extent feasible, removal of any riparian vegetation. Temporary low water crossings will be designed, and inspected daily, to insure fish passage.

Operations will use all feasible techniques to prevent any sediment from entering a drainage system. Materials used for bridge repair, replacement, or temporary crossings will minimize the possibility of introduction of fine sediments or toxins into the drainage system. A BLM project inspector, or designee, will be onsite to insure proper procedures are followed.

D. Heavy equipment will be inspected daily by the BLM project inspector, or designee, to check for leaks. Equipment that may leak lubricants or fuels into a drainage will not be used until leaks are repaired. Equipment operators will be required to carry absorbant pads (or equivalent) designed to absorb and contain any leaks which may occur during operations. Fuel trucks (if used) and/or re-fueling will be done outside of Riparian Reserves and stream crossings. A spill plan will be available to onsite personnel.

E. For bridge and stream crossing replacement, disturbance to Riparian Reserves will be minimized. Any disturbed ground must receive appropriate erosion control treatment (mulching, seeding, planting, etc.) prior to the beginning of the wet season.

F. Water drafting will be conducted only at sites approved by BLM staff. Intake hoses will be screened to prevent entrainment of fish. If possible, water drafting will occur in non-fish-bearing streams. Vehicle approaches will be inspected by BLM personnel or designees to insure damage to riparian areas is minimized.

Mitigations/Conditions of Operation for Road Restoration/Rehabilitation and Culvert Replacement/Repair:

Applicable Standards and Guidelines:

RF-2a. Eliminate road and landing locations in Riparian Reserves.

RF-2e. Minimize disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow.

RF-2f. Restrict sidecasting as necessary to prevent the introduction of sediment into streams.

RF-4. New culverts, bridges, and other stream crossings shall be constructed, and existing culverts, bridges, and other stream crossings determined to pose a substantial risk to riparian conditions will be improved, to accommodate at least the 100-year flood, including associated bedload and debris. Priority for upgrading will be based on the potential impact and ecological value of the riparian resources affected. Crossings will be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of a crossing failure.

RF-6. Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams.

Additional Criteria (as directed by RF-2.d)

A. Heavy equipment operations will use all feasible techniques to prevent any sediment from entering a drainage system during road restoration/rehabilitation work. Only operators with experience in road restoration will be employed for these projects. A BLM project inspector, or designee, will be onsite to insure proper procedures are followed.

B. Heavy equipment will be inspected daily by the BLM project inspector, or designee, to check for leaks. Equipment that leaks lubricants or fuels will not be used until leaks are repaired. Equipment operators will be required to carry absorbant pads (or equivalent) designed to absorb and contain any leaks which may occur during operations. Fuel trucks (if used) and/or re-fueling will be done outside of Riparian Reserves and stream crossings.

C. As often as feasible, any removed vegetation will be scattered on top of the treated road surface which will prevent most rainfall from directly impacting soil and promote rapid growth of future vegetation contoured surfaces are which exposed to rainfall.

A-2 Wildlife Management**STANDARD OPERATING PROCEDURES TO PROTECT SENSITIVE SPECIES**

The occupancy level of spotted owls, marbled murrelets and Pacific fishers may require restrictions on human work activities and noise, or mechanized vegetative treatments within 500 feet of any suitable nesting/roosting habitat or near known nest or den locations.

- Any new BLM public use activities, such as recreation, will be evaluated for impacts to spotted owls, marbled murrelets, Pacific fishers or their nesting, denning or foraging habitat and BLM sensitive or uncommon species.
- After uses and management activities are established in the management area any new marbled murrelet, spotted owl, fisher or BLM sensitive species occupying the area may habituate to the activities. Restrictions to these public use activities are not expected but will be evaluated as needed.

Northern Spotted Owl

Biologists would be required to complete protocol surveys for any project that creates disturbance in or near suitable spotted owl nesting habitat, or alters suitable habitat during the breeding season (February 1 through July 31).

Projects that create disturbance outside of the breeding season (July 31 through January 31) would not require surveys provided suitable habitat is not altered or removed.

Implementation of monitoring surveys for spotted owls would not require restrictions on any management activity or resource use within the area to be monitored.

Marbled Murrelet

Biologists would be required to complete protocol surveys for any project that creates disturbance or alters suitable nesting habitat during the breeding season (March 24 through September 15).

Projects that create disturbance outside of the breeding season (September 16 through March 23) would not require surveys provided suitable habitat is not altered or removed.

Implementation of monitoring surveys for marbled murrelets would not require restrictions on any management activity or resource use within the monitoring area.

Pacific Fisher

Surveys to detect fishers may be required for projects planned in suitable habitat during the breeding season. Project clearance surveys or monitoring surveys for fishers will not require restrictions on any currently allowable activity or resource use.

A-3 Forest Management

Yarding and hauling of merchantable material will only occur during the dry season.

Yarding of merchantable material will only use existing skid roads and haul roads.

Riparian reserves will be identified during implementation planning and inspected during site visits prior to project implementation. Operations within riparian reserves will be designed in a manner, and will only be implemented, to help attain the Aquatic Conservation Strategy objectives within the Northwest Forest Plan.

After yarding operations are completed for each season, re-opened skid roads will be treated with water bars at 50 foot intervals or as necessary to minimize disruption on natural hydrology and prevent sediment from entering watercourses.

Existing skid roads will not be re-opened within riparian reserves.

Any bare soil within riparian reserves present at the end of operations for each season will be mulched with either native brush, slash, or weed-free straw prior to the wet season in order to prevent introduction sediment to watercourses.

To minimize the risk of introducing toxic materials to watercourses, re-fueling and adding lubricants to chainsaws and other mechanical equipment will occur outside of riparian reserves.

To minimize the risk of introducing toxic materials to watercourses, chainsaws will be used in a manner which directs chips and sawdust away from watercourses to the extent feasible.

Pile burning will be conducted outside of riparian reserves.

A- 4 Recreation

- Display maps, use regulations, and resource information on kiosks at developed parking areas and trailheads
- Post vehicle closure signs at sites susceptible to illegal vehicle use
- Post signs along trails to lead visitors in appropriate directions, at private/public property boundaries, and at designated trailheads, parking areas, and campsites
- Contact visitors during regular patrols to gather information and suggestions as to whether their expectations and experiences are being met. Implement corrective actions as adaptive management measures, consistent with planning goals and objectives.
- Barricade vehicle access points to areas closed to vehicle use, such as old logging roads and meadow areas adjacent to Pine Ridge Road and Midslope Road. Types of barricades include large berms, large rocks, logs, or brush.
- Coordinate with other resource specialists to develop monitoring strategies
- Provide well maintained signs and facilities by ensuring they are repaired and replaced as necessary
- Provide regular law enforcement patrols

Trail Construction and Maintenance Guidelines

- Minimize disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow.
- Avoid sidecasting to prevent the introduction of sediment into streams.
- Outsloping of the tread surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is unfeasible or unsafe. Route drainage away from potentially unstable channels, fills, and hill slopes.
- Provide and maintain fish passage at all crossings of existing and potential fish-bearing streams. Small stream crossings would normally be developed using flat rocks (rock ford) to minimize soil disturbance and sediment transport into streams.
- Replace culverts and bridges only during times of low streamflow but prior to upstream migration of adult anadromous fish. Avoid, to the extent feasible, removal of any riparian vegetation.
- Minimize disturbance to riparian habitat. Disturbed ground would be treated with appropriate erosion control measures (mulching, seeding, planting, etc.) prior to the beginning of the wet season.
- Newly constructed trails would have gradients up to 15 percent. Pitch grades up to 20 percent may be used to a maximum of 100 feet, provided erosion can be prevented.
- Newly constructed multi-purpose trails and mountain biking trails would be from three to five feet in width; trails converted from logging roads would be approximately five feet in width.
- Limit culvert use to locations where no other methods are feasible (e.g. grade dips, water bars).
- Keep switchbacks to a minimum wherever possible. Design switchbacks with minimum curve radii of six feet.

- Use native soil to construct new trails.
- Where native soil would result in highly erosive tread, the tread will be surfaced with crushed rock or another stabilizing agent to prevent rutting and erosion.

A-5 Fire Management

The concept of minimum impact suppression tactics (MIST) is to use the minimum amount of forces necessary to effectively achieve the fire management protection objectives consistent with land and resource management objectives. It implies a greater sensitivity to the impacts of suppression tactics and their long-term effects when determining how to implement an appropriate suppression response. In some cases MIST may indicate cold trailing or wet line may be more appropriate than constructed hand line or dozer line. Individual determinations will be dependent on the specific situation and circumstances of each wildfire.

MIST is not intended to represent a separate or distinct classification of firefighting tactics but rather a mind set of how to suppress a wildfire while minimizing the long-term effects of the suppression action. MIST actions may result in an increase in the amount of time spent watching, rather than disturbing, a dying fire to insure it does not rise again. They may also involve additional rehabilitation measures on the site that were not previously carried out. When selecting an appropriate suppression response, firefighter safety must remain the highest concern. In addition, fire managers must closely coordinate actions with the BLM, through the assigned Agency Representative and Resource Advisors.

Guidelines for Drafting Water from Streams Containing Federally Listed Salmon and Trout

- Pumping rate will not exceed 350 gallons per minute
- Pumping rate will not exceed 10 percent of estimated stream flow
- Use streams and pools where water is deep and flowing, as opposed to streams with low flow and small isolated pools
- Pumping will be terminated when the tank is full. The effect of single pumping operations, or multiple pumping operations at the same location, should not result in obvious draw-down of either upstream or downstream pools.

Base and Spike Camp Considerations

- Coordinate with the Resource Advisor in choosing a site with the most reasonable qualities of resource protection and safety concerns
- Evaluate short-term low impact camps such as coyote or spike versus use of longer-term higher impact camps
- Use commercial portable toilet facilities where available. If these cannot be used a latrine hole should be utilized
- Select latrine sites a minimum of 200 feet from water sources with natural screening.
- Constantly evaluate the impacts which will occur, both short and long-term
- Avoid placing fire camps 0.25 miles and heliports within 0.5 miles of suitable spotted owl and marbled murrelet habitat between February 1st and September 15th. Where possible, expedient, and where fire fighter safety will not be compromised or fire fighting

suppression activities significantly hindered, avoid placing spike camps and staging areas within 0.25 miles of suitable spotted owl and marbled murrelet habitat between February 1st and September 15th. Consult with the assigned wildlife biologist for information on known active eagle nest locations

Aviation Use Guidelines

- Use long line remote hook in lieu of constructed helispots for delivery or retrieval of supplies and gear
- Take precautions to insure noxious weeds are not inadvertently spread through the deployment of cargo nets and other external loads
- Use natural openings for helispots and paracargo landing zones as far as practical. If construction is necessary, avoid high visitor use areas
- Consider maintenance of existing helispots over creating new sites
- Buck and limb only what is necessary to achieve safe/practical operating space in and around the landing pad area
- When flying over forested regions between February 1st and September 15th, restrict flight elevations to at least 500 feet, preferably 1000 feet, above the canopy of suitable marbled murrelet and spotted owl habitat
- When flying over known active spotted owl nests between February 1st and July 9th, restrict flight elevations to at least 1000 feet above the canopy within 0.25 miles of the nest site. Consult with the assigned wildlife biologist for information on known active owl nest locations.

Retardant Use

- During initial attack, fire managers must weigh the non-use of retardant with the probability of initial attack crews being able to successfully control or contain a wildfire. If it is determined that use of retardant may prevent a larger, more damaging wildfire, then the manager might consider retardant use even in sensitive areas. This decision must take into account all values at risk and the consequences of larger firefighting forces' impact on the land.
- Consider impacts of water drops versus use of foam/retardant. If foam/retardant is deemed necessary, consider use of foam before retardant use.
- Avoid aerial application of retardant or foam within 300 feet of waterways
- When alternative line construction tactics are not available due to terrain constraints, congested area, life and property concerns, or lack of ground personnel, it is acceptable to anchor the foam or retardant application to the waterway. When anchoring a retardant or foam line to a waterway, use the most accurate method of delivery in order to minimize placement of retardant or foam in the waterway (e.g., a helicopter rather than a heavy airtanker).

Emergency Stabilization

- Actions shall be implemented to reduce the effects of the wildland fire prior to the onset of winter precipitation.
- Remove woody debris or slash from stream channels only if it may cause an imminent threat of damage to life or property (e.g., above a culvert inlet that could potentially plug)

- Implement erosion control measures to restore natural drainage patterns and minimize the amount of exposed mineral soil, thereby reducing sediment delivery to stream channels
- Decommission roads and stream crossings constructed for fire suppression actions
- Decommission dams at drafting sites developed for the fire suppression actions
- Include a fisheries biologist with local knowledge on the wildland fire suppression rehabilitation and BAER teams for identifying activities that benefit listed salmonids and their critical habitat.

Rehabilitation Guidelines

- Pick up and remove all flagging, garbage, litter, and equipment. Dispose of trash appropriately.
- Discourage use of newly established trails created during the suppression effort by covering with brush, limbs, small diameter poles, and rotten logs in a naturally appearing arrangement
- Replace dug-out soil and/or duff and obliterate any berms created during the suppression effort
- Where soil has been exposed and compacted, such as in camps, on user-trails, at helispots and pump sites, scarify the top 2-4 inches and scatter with needles, twigs, rocks, and dead branches
- Where trees were cut or limbed, cut stumps flush with ground, scatter limbs and boles, out of sight in unburned area
- Dozer lines may be replanted with indigenous tree species if determined necessary by the Resource Advisor
- If impacted trails have developed on slopes greater than six percent and it has been determined by the Resource Advisor that waterbars are necessary, they will be spaced according to the following guidelines:

<u>Trail Percent Grade</u>	<u>Maximum Spacing Ft.</u>
6-9	400
10-15	200
15-25	100
25+	50

Fire Restriction and Emergency Closure Guidelines

- Through coordination with the USFS, NPS, and CalFire, restrictions shall be determined by taking into account the following factors:
 - 1,000 hour fuel moisture content is at 90th percentile or above
 - Live fuel moisture content is 75 percent or less
 - Three-day mean energy release component (ERC) is at 90 percentile or above
 - Depleted resources due to fire activity in the local area and/or state
 - The area is receiving high occurrences of wildland fires and/or existing wildfires are highly resistant to control
 - Fire Danger Rating of Very High for 3 consecutive days, with predicted stable or upward trend
 - A Fire Preparedness level of 4 or above.

Appendix B – Definition of Terms (Cultural Resources and Fire Management)

B-1 Cultural Resource Inventory Classes

Class I – Relies on research and review of existing records, maps and other documents describing cultural resources of specific project areas. This level of effort typically involves reference to in house cultural resource base maps, cultural resource survey reports, and/or site records. Similar references are normally sought out from the appropriate California Historical Resources Information System (CHRIS) Information Centers (IC). Historical records pertaining to Del Norte and Humboldt counties are housed at the North Coastal IC located in Klamath and operated by the Yurok Tribe Cultural Resources Program.

Class II – Includes the same activities as a Class I, and the additional steps of performing in-field cultural resource inventory (archaeological survey), site recording, and survey reporting. Field work is directed to areas considered likely to show a high-probability for the presence of historic properties. Appropriate areas are selected on the judgement of the cultural resource specialist, based on working knowledge of the resource area, and the results of the Class I investigations. Survey areas are recorded using GPS equipment, and GIS is used to store spatial information associated with the inventory, and referenced in the survey report.

Class III – Investigations are similar to those of Class II efforts, except that the archaeological survey field work covers all accessible areas of the project area. Pedestrian transects typically cover all ground at 15 meter (or less) intervals except where slopes are greater than 30 percent or vegetation prevents feasible passage. In areas where ground cover is heavy, periodic exposure of the top soil is commonly warranted. Results are recorded in the same manner as are those of Class II inventories.

B-2 Fire Regime Conditions

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993, Brown 1995). Coarsescale definitions for natural (historical) fire regimes have been developed by Hardy et al. (2001) and Schmidt et al. (2002) and interpreted for fire and fuels management by Hann and Bunnell (2001). The five natural (historical) fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation.

These five regimes include:

- I – 0-35 year frequency and low (surface fires most common) to mixed severity (less than 75 percent of the dominant overstory vegetation replaced)
- II – 0-35 year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced)
- III – 35-100+ year frequency and mixed severity (less than 75 percent of the dominant overstory vegetation replaced)
- IV – 35-100+ year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced)
- V – 200+ year frequency and high (stand replacement) severity

Maps referenced in Lacks Creek Management Plan

The following pages contain all maps referenced within the plan:

Map 1-1 Lacks Creek Vicinity

Map 1-2 Planning and Management Area Boundary

Map 2-1 Acquisition History & Deed Restrictions

Map 2-2 Regional Fire History

Map 3-1 Proposed Action, Resource Management & Restoration Projects

Map 3-2 Proposed Action, Recreation & Transportation

Map 3-3 Proposed Action, Fire Suppression Equipment Restrictions